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REPORT

OF THE

MOTOR CAR QUALITY ENQUIRY COMMITTEE

1 December 1967

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GOVERNMENT OF INDIA

MINISTRY OF INDUSTRIAL DEVELOPMENT AND COMPANY AFFAIRS

DEPARTMENT OF INDUSTRIAL DEVELOPMENT

New Delhi, the 12th February, 1968

RESOLUTION

In view of the widespread complaints about the quality of motor cars manufactured in India, the Government had, in exercise of the powers conferred by Section 15 of the Industries (Development and Regulation) Act, 1951, appointed, in their Resolution dated the 11th July, 1967, a Committee under the Chairmanship of Shri G. Pande to investigate and make recommendations in regard to the following—

(a) The extent of deterioration in the quality of motor cars, the circumstances and reasons therefor;

(b) Whether minimum standards of quality and performance have been laid down and ensured by the car makers for the raw materials, components, and sub-assemblies, bought-out or manufactured by them, and for the assembled cars;

(c) Whether the equipment, facilities, and arrangements with them are adequate and effectively used for proper testing and inspection, and what are the additional requirements in respect of the same to ensure better inspection and quality control;

(d) The part played by the indigenous, ancillary and other industries in this deterioration and the steps to be taken for effecting improvements therein;

(e) The nature of effectiveness of the warranties and the adequacy and promptness of the aftersales service rendered by the dealers and other concerned, and, finally;

(f) The necessary and feasible steps to be taken by the Central Government in regard to these matters.

2. The Committee submitted its report on 1st December, 1967. It is a very comprehensive study of the working of the industry relating to the manufacture of motor cars and its ancillary industries and has drawn attention to the reasons for the deterioration in the quality of cars manufactured in the country, the inadequacies in the quality control procedures of car and ancillary producers, the lack of proper organisation, inadequacies of technical know-how, equipment and testing facilities and difficulties in obtaining the right type and quantities of raw materials etc. The Committee has also made recommendations for the rectification of various

defects and improvement of the quality of motor cars produced in the country.

A summary of the various recommendations and Government's decisions thereon is given in the annexure.

3. The implementation of the recommendations would require concerted and detailed action by the industry, Government and dealers over a period of time. In order to ensure that the necessary improvements are effected speedily, Government intend to arrange for periodical review of the steps taken to implement the recommendations.

4. Government wish to place on record their high appreciation of the thoroughness with which the Committee has studied the various problems and made practical and constructive recommendations.

ORDER

ORDERED that a copy of this Resolution be communicated to all concerned and that it be published in the Gazette of India Extraordinary.

Sd. (N. SUBRAHMANYAM)
Special Secretary to the Government of India

ANNEXURE

Recommendation of Committee	Government's decision
Concerning Car Makers	
1. The management should become fully quality conscious and instill this consciousness at all levels of their staff and workers, through periodical lectures, demonstrations, circulation of pamphlets, awards, and incentives.	Accepted. The Industry will be asked to have discussions among themselves and put forward a common programme for implementing the recommendations with a definite time schedule.
2. The managerial staff should be given training in one of the organized institutes on modern management techniques.	
3. Training courses in inspection and quality control techniques for the staff posted in these departments should be organised along with periodical refresher courses.	
4. A separate Inspection Department manned by well qualified personnel should be established in each plant and should be directly responsible to the top management.	
5. There should be a separate quality control Department manned by proper qualified personnel.	
6. Every plant should have a Company Standards Department to liaise with the Indian Standards Institution and also to lay down required company standards.	
7. Proper inspection and statistical sampling procedures and statistical quality control methods should be evolved for adoption in the three plants.	
8. Statistical control methods should be employed from the inspection of the incoming raw materials and components, through the assembly lines and right upto the finished products.	
9. Indian Standards for raw materials, components, statistical quality control methods and test procedures should be followed wherever they exist. Raw materials and components carrying the ISI Certification Mark should be purchased whenever they are available.	Accepted. The industry will be directed to obtain specifications, standards and test procedures established for this purpose from the Indian Standards Institution and to purchase materials covered by the ISI Certification Mark.
10. Every plant should have adequate testing facilities for raw materials and components.	Accepted. The car makers will be directed to approach Government for any assistance needed for import of equipment etc. and to indicate the test rigs already with them and what additions they propose to make either individually or jointly within a period of six months.
11. Test rigs for testing of performance requirements of components and for evaluating the life of the bought-out components should be installed. Samples of bought-out components should also be continuously tested on test cars and test tracks. Adequate number of test cars should be earmarked for this purpose.	
12. The layout of some of the departments of the car makers should be revised whenever an opportunity arises to enable smooth flow of materials and components and to avoid duplicate handling.	Accepted. The manufacturers will be directed to implement the recommendations and confirm compliance.
13. A Research and Development Section should be established at each of the plant for redesigning components, developing new designs and analysing defects with a view to taking corrective measures.	

Recommendation of Committee	Government's decision
14. The spare equipment capacity available should be allowed to be utilized by other plants/ancillary producers.	The manufacturers will be asked to consider this point, even in their own interests, to ensure maximum utilisation of the equipment.
15. Detailed and specific requirements of standards should be furnished to the ancillary producers in addition to making available to them the testing facilities at the car maker's plant.	Accepted. Manufacturers will be directed accordingly.
16. Proper and uniform purchase and payment policies and contractual agreements should be laid down between the car maker, the ancillary producer and their suppliers, on a long term basis. Necessary provisions for penalties and compensation for non-compliance should be introduced in these agreements to ensure consistency.	Accepted. The industry will be directed to discuss with the Association of Ancillary Manufacturers and the Development Commissioner, Small Scale Industries evolve a uniform purchase policy within six months.
17. All materials should be accepted only after proper inspection and testing, and not on the basis of previous supplies or brand names.	Accepted. The industry will be directed to lay down a detailed code of inspection and testing in consultation with the suppliers. The code should be strongly adhered to thereafter.
18. A thorough pre-delivery inspection of all cars should be made by the car maker before delivery to the dealer.	Accepted. The manufacturers and dealers will be asked to lay down a full pre-delivery inspection procedure and report compliance. A case history of the car should be maintained.
19. No car with deficient supplies of parts should be sold to the dealer. Cars should have the stipulated service tools of proper quality.	Accepted. Manufacturers will also be directed to specify the accessories and tools to be supplied with each car.
20. Tamper proof speed governors should be fitted to the cars to minimise reckless driving of the cars from the car maker's plant to the dealer's establishment.	Accepted. The industry will be advised accordingly.
21. Proper procedures for preventive maintenance and timely repair of machinery and equipment should be laid down.	
22. A proper system of collection of field data with regard to the performance of passenger cars should be evolved so that information regarding complaints, defects and failures is fed back to the car maker with a view to analysing their causes and also for taking corrective measures.	Accepted. The manufacturers will be requested to discuss among themselves and their respective dealers and evolve a uniform practice of reporting performance data.
23. The warranty with which cars are sold should be uniformly valid for a period of 12 months or a distance covered of 16,000 Kms., whichever occurs earlier. Also, all defects due to faulty manufacture or bad workmanship should be rectified and defective parts replaced during this period without passing any part of the burden, including incidental charges, to the customer.	Accepted. The manufacturers will be directed to comply with the recommendation.
24. Car makers should evolve a proper procedure for disposal of rejected material and parts so as to ensure that they do not find their way back to their plants.	Accepted. The manufacturers will be asked to evolve a proper procedure within 6 months and inform Government of the steps taken.

Recommendation of Committee	Government's decision
25. The car makers, together with the ancillary producers, should try and develop as many interchangeable components as possible for the three cars in order to increase productivity reduce cost and improve quality.	Accepted. The manufacturers will be asked to take immediate steps in consultation with ancillary manufacturers.
26. The dealer's workshops should be visited periodically by the car maker to ensure that the spare parts that go into the original equipment are being stocked, for use during the warranty period.	Accepted. The manufacturers will be directed to take immediate action and report compliance.
27. When defects in critical components are reported from the field, the owners of all cars from that batch should be notified so that the cars are brought immediately to the nearest dealer's service station for check and rectification of defects.	Accepted. The industry will be directed to comply strictly with this recommendation.
28. The car makers may be induced to give up the production of certain components which they are currently manufacturing, which could more profitably be manufactured by the ancillary producers.	Accepted. The manufacturers will be advised accordingly.
Concerning Ancillary Industries	
1. The management should become fully, quality conscious and instill this consciousness at all levels of their staff and workers, through periodical lectures, demonstrations, circulation of pamphlets, awards and incentives.	Accepted. The All India Automobile and Ancillary Industries Association will be requested to evolve a uniform practice after discussions among the individual ancillary units and formulate a plan of action within six months.
2. The managerial staff should be given training in one of the organised institutes on modern management techniques.	
3. Training courses in inspection and quality control techniques for the staff posted in these Departments should be organised along with periodical refresher courses.	
4. A separate Inspection Department manned by well qualified personnel should be established in each unit and should be directly responsible to the top management.	
5. There should be a separate quality control department manned by proper qualified personnel.	
6. Each unit should have a company standards department to liaise with the Indian Standards Institution and also to lay down required company standards.	
7. Proper inspection and statistical sampling procedures and statistical quality control methods should be evolved for adoption in each unit.	
8. Statistical quality control methods should be employed from the inspection of the incoming raw materials and sub-components through the assembly lines and right up to the finished products.	

Recommendation of Committee	Government's decision
9. Indian Standards for raw materials and sub-components, statistical quality control methods and test procedures should be followed wherever they exist. Raw materials and sub components carrying the ISI Certification Mark should be purchased wherever they are available.	Accepted. The All India Automobile and Ancillary Industries Association will be requested to take up the matter with the Indian Standards Institution for obtaining ISI Standards that have been evolved either for specification or raw materials or test procedures and existing ISI Marking practice already introduced.
10. Each unit should have adequate testing facilities for all raw materials and components. Alternatively, where possible, a group of ancillary units should establish testing facilities for use by all of them.	Accepted. The individual ancillary units will be directed to take stock of the test facilities available with them for raw materials and make out a list of additional facilities they propose to establish. This should be further discussed at the Association level so that duplication of facilities could be avoided as far as possible.
11. Test rigs for testing of performance requirements and evaluating the life of the components should be installed.	Accepted. The ancillary producers will be directed to take action accordingly.
12. A Research & Development Section should be established at each unit for redesigning components, developing new designs and analysing defects with a view to taking corrective measures.	Accepted. The ancillary producers will be asked to implement the recommendation and report the action taken.
13. Proper and uniform purchase and payment policies and contractual agreements should be laid down between the ancillary industry and their suppliers.	Accepted. The manufacturers will be requested to consider the matter at the level of the All India Automobile & Ancillary Industries Association and evolve a uniform purchase and payment policy and a standard contractual agreement between the ancillary units and their suppliers. Similar policy should be applicable for the purchase from units in the small scale for which the Association should conduct discussions with the Development Commissioner, Small Scale Industries.
14. All material should be accepted after proper inspection and testing and not on the basis of previous supplies or brand names.	Accepted. The manufacturers will be requested to take action accordingly.
15. A proper system of collection of field data with regard to the performance of their components should be evolved so that information regarding complaints, defects and failures are fed back to the producer with a view to analysing their causes and also for taking corrective measures.	Accepted. The manufacturers will be requested to discuss among themselves and evolve a uniform practice of reporting performance data.
16. The ancillary producers, together with the car makers, should try and develop as many interchangeable components as possible for the three cars in order to increase productivity, reduce cost and improve quality.	Accepted. The ancillary producers will be directed to take up the matter at the Association level to evolve a provisional list of components that could be made interchangeable among the 3 makes of cars.

Recommendation of Committee	Government's decision
17. Proper procedures for preventive maintenance and timely repair of machinery and equipment should be laid down.	Accepted. The ancillary producers will be directed to take action accordingly.
18. The All India Automobile and Ancillary Association should devise ways and means to make its constituents observe the code of conduct evolved by it under pain of being disaffiliated under public notification if there is a breach of it by any producer.	Accepted. The Association will be addressed accordingly.

Concerning Dealers

Recommendation of Committee	Government's decision
1. Every dealer should have proper equipment and adequate facilities for servicing and repair of the cars as recommended by the car maker.	Accepted. Each car maker will be directed to evolve the standard procedures for their dealers and to introduce the procedure within six months.
2. A dealer should have adequate stock of such parts as are used in the original equipment and should use no others for replacement of defective parts during the warranty period.	
3. The pre-delivery inspection should be thoroughly done and all defects rectified before delivering a car to the customer.	
4. The dealer should make available a list of charges for standard jobs to the user.	Accepted. All the dealers will be advised through the respective car makers to comply with the recommendation.
5. The dealer should ensure that the cars transported by road do not exceed the speed limits specified by the car maker to minimise defects arising during their transportation.	Accepted. Each of the car makers will be directed to evolve standard procedures in these respects and to direct their dealers to introduce them within six months.
6. The dealer should be given full authority to settle complaints regarding defective parts irrespective of the agreement that the car maker might have obtained/entered into with the concerned ancillary suppliers and thus ensure that complaints are attended to promptly without the customer having to wait for long period.	
7. The dealer should maintain proper record of complaints received from car users and the action taken.	

Concerning the Government

Recommendation of Committee	Government's decision
1. The Indian Standards Institution should be requested to formulate on priority basis, standards for raw materials and components with the assistance of the car makers, ancillary producers and their suppliers.	Accepted. The Indian Standards Institution will be requested to initiate action for drawing up standards according to priorities to be assigned to various items. The representatives of producers will also be associated with this work. Efforts should be made to complete the work relating to priority items within 12 months.
2. The car makers should be directed to adopt and implement Indian Standards as and when these are formulated.	Accepted. The industry will be directed to adopt such standards as and when formulated.

Recommendation of Committee	Government's decision
3. ISI Certification Marks Schemes should be made compulsory for all the ancillary producers on the basis of priorities to be established.	The Indian Standards Institution will be requested to prepare a list of priority items in consultation with the ancillary producers and in respect of these items ISI marking scheme might be made compulsory.
4. The public sector steel plants should be directed to make available raw materials of the qualities required by the industry, irrespective of the quantities involved.	Accepted. The Department of Iron & Steel will be requested to take appropriate steps after a list of requirements and quantities in each category is drawn up by the Associations concerned.
5. The fabrication of special two-tier bogie wagons for transporting multiple cars by rail should be expedited.	Accepted. The Ministry of Railways will be requested to take appropriate steps.
6. The Government should stop assistance to the ancillary producers whose products are found consistently sub-standard and take other corrective action. They should also not be permitted renewal of their foreign collaboration, if any.	Accepted.
7. All the three car makers should be directed to sell cars under a warranty which should be uniformly valid for a period of 12 months or a distance covered of 16,000 kilometers, whichever occurs earlier. Also, all defects due to manufacture or workmanship should be rectified and defective parts replaced during this period without passing any part of the burden including incidental charges, to the customer.	Accepted. The manufacturers will be directed to take action accordingly.
8. In order to ensure that the car makers and the ancillary producers adopt the relevant recommendations enumerated above, technical audit cells should be set up in the car makers plants and also in the ancillary producers units, individually or collectively, as considered necessary, with a view to arresting the deterioration of quality and giving trouble-free service to the customers.	Accepted in principle. A detailed scheme for establishment of an organisation will be prepared for further action.
9. Foreign exchange should be made available for purchasing such raw materials/components of the required quality as are not available at present in the country and the industry should be assisted in getting their men trained in overseas countries.	Accepted.
10. The Government may also consider permitting the car makers to manufacture 'de-luxe model' without price and distribution control, to provide necessary incentive for technological development and also for improving the quality of the cars which are now being manufactured.	This recommendation will be examined after all the other recommendations are implemented.
11. The Government should assist in the early setting up of the Co-operative Research and Development Organisation for the automobile industry which has already been agreed in principle. Till such time as this organisation is set up, the facilities for testing cars available with the Ministry of Defence should be utilised by the car makers.	Accepted. The Indian automobile Manufacturers' Association will be asked to expedite the establishment of the research organisation and steps will be taken to ensure that definite progress is made within six months. The car makers will also be directed to utilise the testing facilities available with the Ministry of Defence.

Recommendation of Committee	Government's decision
12. The Government may also consider giving a rebate on the taxes to the car makers and the ancillary producers in proportion to the expenditure on inspection and quality control.	This recommendation will be examined in consultation with the Ministry of Finance.
13. Government should consider imposing stricter driving tests before driving licences are granted.	Accepted.

MISCELLANEOUS

1. Registration for purchase of a car should be made with the regional representative of the car manufacturers and customers should stipulate the dealer through whom the car will be accepted.	Accepted.
2. Proper conditions of working, adequate amenities, awards and incentives should be provided to the workers so that quality consciousness could be instilled in them.	Accepted. The manufacturers will be advised accordingly.
3. The quality of paints should be improved. Suitable rubber components should be developed to withstand severe atmospheric conditions obtaining in the country. The manufacture of plate glass should be expedited and till then strict inspection and control methods should be adopted.	Accepted. Appropriate steps will be taken to improve the quality of paints and rubber components and where necessary, imports also will be allowed to the required extent. Even now plate glass for windscreens are being imported pending development of indigenous industry.

CHAPTER 1

INTRODUCTION

1.1. The car industry in the country has been the target of mounting criticism for the last few years. Customer dissatisfaction has been voiced from all possible forums. The subject came up for discussions on several occasions in both the Houses of Parliament. The Press has also been emphasizing repeatedly the need for action to arrest and reverse the process of deterioration in quality. The nature of the complaints has varied widely and, of late, has covered all makes of cars produced in the country. It appears that in the discussions which the Government had with the various sections of the industry, each section was engaged in shifting its responsibility to someone else rather than take adequate steps to put its own house in order. Consequently, the Government of India decided to have detailed investigations made into all the aspects of the problem with a view to finding suitable remedies.

1.2. In pursuance of this decision, the Government appointed a committee of enquiry, called the Motor Car Quality Enquiry Committee, to investigate and make recommendations on the following matters—

(a) The extent of deterioration in the quality of motor cars, the circumstances and reasons therefor;

(b) Whether minimum standards of quality and performance have been laid down and ensured by the car makers for the raw materials, components, and sub-assemblies, bought-out or manufactured by them, and for the assembled cars;

(c) Whether the equipment, facilities, and arrangements with them are adequate and effectively used for proper testing and inspection, and what are the additional requirements in respect of the same to ensure better inspection and quality control;

(d) The part played by the indigenous, ancillary, and other industries in this deterioration and the steps to be taken for effecting improvements therein;

(e) The nature and effectiveness of the warranties and the adequacy and promptness of the after-sales service rendered by the dealers and others concerned, and finally;

(f) The necessary and feasible steps to be taken by the Central Government in regard to these matters.

1.3. The Government Order, which also gives the composition of the Committee, is reproduced in Appendix A. Brig. T. B. Poduval, however, resigned from the membership of the Committee after attending the first meeting on 24th July, 1967.

1.4. Apart from visits to the factories of motor car makers and ancillary manufacturers and discussions with their representatives and others. as described later on, the Committee had many formal and informal sittings. Due to the extent of the work involved in the collection of the data, the extra time demanded by the parties for replying to the questionnaires, the examination of witnesses, the discussions that had to be held with various individuals and organisations, and the detailed studies that had to be undertaken the Committee could not complete its work within 3 months as originally stipulated. The Committee was, therefore, given time upto the end of November, 1967, to submit its report.

1.5. The motor car is a complex and intricate fast-moving machine, and its manufacture involves the making and assembling of several thousand components. A large variety of raw materials and manufacturing processes are involved, which call for varied degrees of engineering and organisational skills. Generally speaking, some parts are manufactured by the car makers in their own works and many others are bought-out from ancillary manufacturers. In other words, there are several hundreds of producers, big and small, whose efforts go to complete a passenger car. The nature and extent of the contribution of the groups concerned to the present state of affairs in respect of the quality of the end-product, has been the main subject of the enquiry conducted by the Committee. It may also not be out of place to mention here that, in what follows, the Committee has confined its enquiry to the passenger cars and the allied industries only.

1.6. At the very commencement of the investigation, the Committee observed that there has been no systematic recording of the nature of troubles and defects by the car makers, the ancillary producers, or the dealers of cars. The Committee had, therefore, to face many difficulties in collecting the required information on past performance. However, the Committee was able to gather sufficient data to arrive at definite conclusions.

1.7. The motor car industry is, at present, under a form of protection which has provided it the much needed support for its development. There has also been a high degree of informal control on the first costs and price revisions, with hardly any implied or effective control on the quality of the cars. As against these factors, note has also to be taken that car manufacture is on a low priority schedule and has often to do without the degree of assistance that it needs for its better growth. Other difficulties may be summed up as emanating from insufficient supplies and delayed deliveries of proper raw materials and car components, and the inadequacy of foreign exchange even for the most essential requirements. Nevertheless, aided by the large waiting list of customers wanting to own cars and the virtual impracticability of importing any vehicles from foreign markets, the car manufacturer has, in effect, attained the status of a monopolist. Under such intriguing conditions, many an enterprise would tend to assume an unsympathetic attitude towards its customers and in this respect the Committee is constrained to remark that their protestations notwithstanding, the car industry has proved no exception.

1.8. The Committee has had to take into account the fact that the Government had already asked the Tariff Commission, as a part of its review and tariff enquiry, to look into the question of the need for the continuance or otherwise of the protection given to the automobile industry and some of the ancillaries, as also to enquire into their cost structure and fair selling prices. While, therefore, concentrating its efforts mainly in finding out the causes for the deterioration in the quality of motor cars and making suggestions for halting and remedying them, the Committee has had constantly to be on its guard from wandering into the fields of protection and costs. The Committee would, however, like to make the observation that improvement in quality need not necessarily lead to increased costs and, in fact, if the production is viable, effective quality control, besides providing better products and increased consumer satisfaction, may also be instrumental in effecting economics.

1.9. Due to the very nature of the issues and tasks involved, the Committee started its work well aware of the difficulty of finding quick and ready solutions for all the ills the car industry is suffering from. These ills cannot also be divorced from the difficulties, all of which again are not the creation of the car makers either. Naturally, there are also many inherent conflicts amongst the various parties involved in the game of car making. An then, however much of a truism it is, the downhill pace of deterioration is ever so much faster than the uphill task of improvement.

1.10. The Committee has, therefore, endeavoured to locate the main and irritating defects and, as far as feasible, to give short-term remedies for removing them so that the users have an early relief. These can, in a nutshell, be described as intensifying supervision and inspection while purchasing raw materials and ancillaries, producing the components, assembling them, and finishing the cars. The Committee has then proceeded to indicate long-term measures for improving the quality of the cars. In this respect, apart from a better technological handling of the equipment and the processes involved, what is needed is the determination, on the part of the management and workers alike, to put the maximum emphasis on a healthy change in their outlook towards operating efficiency and quality control, taking a pride in their jobs, and displaying a greater receptiveness to proper development and research.

CHAPTER 2

METHODOLOGY

2.1. Essentially the approach of the Committee to the problem of complaints has been to collect detailed information from the car makers, the ancillary producers, the dealers, the users, and others concerned on the nature and the extent of defects which have been reported on passenger cars during the past few years. This information has been correlated and analysed to determine to extent of deterioration. The Committee has also examined in detail the practices obtaining in the works of the main car makers as well as the practices obtaining, in general, in the works of ancillary producers, to determine the extent to which correct manufacturing processes and quality standards and controls are being followed. The detailed manner in which this work has been undertaken is explained in the subsequent paragraphs.

2.2. The Committee invited reports from the car using public by issuing a questionnaire through public notification. Information was elicited in respect of each make of car with regard to the defects observed by them at the time of purchase of the new vehicle, during the warranty period and one year thereafter. The Committee was somewhat disappointed at the small number of users who responded to this request. All the same, the replies received were adequate for drawing correct conclusions. The information so obtained, coupled with the reports available already with the Government, was processed to determine the extent to which there has been user dissatisfaction with the quality of the cars and to identify the areas in which serious deterioration in quality has taken place in the recent past.

2.3. The above information was also correlated to similar data furnished by the car makers themselves, as also by a number of main dealers all over the country, who had similarly been addressed for such information. The extent and areas of deterioration of each make of car were thus identified and are discussed in greater detail further on in this Report. However, it has not been possible for the Committee to quantify the degree of deterioration during the past few years due to the absence of exact information on the subject.

2.4. In further detailed questionnaires addressed to the car makers, information was obtained from them with regard to their management, the equipment and other facilities they have, the processes of manufacture in vogue, the standards laid down by them, and the manner of quality control and inspection which they enforce, not only in their own works but also in regard to the materials and components which they buy from other sources. During visits and discussions with them, an assessment was made of their difficulties and the assistance they needed for improving their products.

2.5. In like manner the ancillary producers were addressed and some of the plants were visited. Discussions were held with them for eliciting detailed information with regard to the facilities available with them, the difficulties being experienced in getting their supplies and in the disposal of their products, the manner in which they manage and control their works and the assistance needed by them.

2.5.1. A meeting was held with representatives of the small scale industries, under the auspices of the Development Commissioner, with a view to assessing their problems, their contribution to the well being of the car industry, as well as their share in its shortcomings.

2.6. Indian embassies in U.K., U.S.A., and Japan were also addressed for relevant information concerning the motor car industry in these countries, with particular reference to the cars of corresponding performance.

2.7. A list of factories visited and managements and associations interviewed is given in Appendix B.

2.8. Since a number of issues arising out of the investigations pointed towards controls, curbs and protection imposed through a number of governmental measures, the Committee discussed the various issues involved with the representatives of the Ministry of Industrial Development and Company Affairs and the Director General of Technical Development. Discussions were also held with the Development Commissioner Small Scale Industries, the Director General of the Indian Standards Institution and the concerned officers of the Council of Scientific and Industrial Research, the Directorate General of Supplies & Disposals and the Ministry of Defence.

2.9. The data collected by the Committee has been fairly voluminous. In the nature of things as they presented themselves and the time at the disposal of the Committee, not all of it could be fully used, nor would the conclusions and the recommendations have been different if this had been done. However, the officers of the Indian Standards Institution and the Consultancy Wing of the National Industrial Development Corporation, not only most helpfully assisted in the work of the committee by making useful visits to work sites but also processed and presented the collected data in a scientific manner. The Committee is grateful to them for their valuable assistance.

CHAPTER 3

DEVELOPMENT OF THE MOTOR CAR INDUSTRY

3.1. In India, the foundations of the motor car industry were laid, in a way, in the year 1928 at Bombay, when the General Motors India) began assembling trucks and cars from completely imported components from the U.S.A. Soon thereafter, the Ford Motor Company (India) established its branches at Madras in 1930 and at Bombay and Calcutta in 1931. The Hindustan Motors Ltd., and the Premier Automobiles Ltd., were formed in the years 1942 and 1944, respectively, for the specific purpose of manufacturing some vital automobile components in addition to assembling vehicles from imported components. The Standard Motor Products of India Ltd. joined the trade in 1948. All these three concerns had also entered into arrangements for foreign collaboration with the respective car makers. Nevertheless, the Automobile Industry in this Country may be said to have made a real beginning only in 1953, when the Government accepted the Tariff Commissions First Report on the Automobile Industry. A ban was placed on mere assembling of cars with imported components and the manufacture of various vehicles was to be undertaken by gradually building up the indigenous content thereof.

3.2. The establishment of the automobile manufacturing units in the country has led to the development of a host of other industries. To illustrate this point, till 1953, the few units manufacturing components for automobiles like pistons, springs and certain rubber components, and minor assemblies had come into being essentially to meet the demands of the spare parts market. With the growth of the main automobile industry there has also been a big spurt in the development of the car ancillary industries for producing related raw materials, semis and components.

3.3. Naturally, such an industry can give satisfactory service to its customers only through a network of dealer organizations. In the infra range may be included petrol distributing stations, spare parts market, garages and service stations. Unfortunately, in the course of time, spurious products have appeared in the market along with quacks for repair and maintenance of cars. This kind of development can be aptly compared to the growth of slums in the cities.

3.4. The integrated automobile industry in India has been growing, unlike in other countries, under an atmosphere of protection, curbs, and controls. Lately, its growth in the field of car marking has, to some extent, been affected by the inadequacy of foreign exchange resources. In the order of priorities, the manufacture of cars does not enjoy a favoured place. On the other hand, with the rapid growth of industrial development, cars have become a necessity. The demand has been growing steeply but the production has not kept pace with it. In such a situation, apart from directing the growth of the industry towards complete indigenization, the Government has also considered it expedient to control both its price and distribution. The rising demand has created conditions of a seller's market which was unfortunately influenced the industry to take recourse to sacrificing quality for keeping their production lines busy.

3.5. In the advanced countries, the automobile industry, as a general pattern, has developed on the basis that the car manufacturer is mainly an assembler producing limited types of components but buying out the others. The proportion of components and sub-assemblies, that are bought out in other countries, vary from manufacturer to manufacturer. In India, due to historical reasons, the ancillary industry came into being, in substance, only after the car makers had decided to establish facilities in their own premises to manufacture many major and minor components. More or less, this broad pattern has been maintained till today. However, there are some components which the car makers need not have undertaken to manufacture in their own works but for the compelling necessity at that time. Many of these, at this stage, can more profitably be produced by the ancillary industry.

3.6. The automobile ancillary industry has made rapid strides during the last 15 years. The industry covers a wide range of products that are required by the car makers as original equipment. There is also the replacement market to cater for. The important products of products are also being eported. Not all the ancillary manufacturers under collaboration with reputed foreign producers. Some of these products are also being exported. Not all the ancillary manufactures have, however, adopted rigid quality and production controls in their plants. It is distressing to record that a large number of the medium and smaller ancillary producers give little thought to quality and reliability and many of them even do not hesitate to market inferior and spurious products in the spare parts market.

3.7. The ancillary industry enjoys the same kind of protection as the car industry due to the restriction imposed on imported components. However, unlike the cars, there is no distribution and price control on the products of the ancillary industry. The position in respect of raw material availability is as difficult as for the cars. However, it does enjoy a priority for the import of raw materials. These advantages have greatly benefited its growth.

3.8. Some of the automibile components are also being manufactured by the small scale industry. The Government is giving considerable encouragement to the development of the small-scale units with a view to creating more employment and dispersal of industries. Such units are being sponsored by the State Directors of Industries and their development is co-ordinated at the central level by the Development Commissioner, Small Scale Industries. The Development Commissioner has regional service institutes which render technical assistance on matters of production, inspection and testing. The small-scale units are also being assisted financially by the National Small Industries Corporation. Although some of the small-scale units have begun to supply components directly to the car makers, as also to some of the bigger ancillary producers, the overall contribution by the small-scale sector for original equipment supplies has not yet reached any appreciable proportion. The major part of the production from the small-scale units only finds its way into the spare parts market.

3.9. The automobile and the ancillary industries require a variety of raw materials—ferrous, non-ferrous and non-metallic. Ferrous materials include carbon and alloy steels in different forms, cold rolled steel sheets of deep drawing quality, castings, ball and roller bearings. Non-ferrous materials include copper and brass in various wrought forms, lead, zinc, tin, antimony etc. Non-metallic materials include rubber components, leather, upholstery, tyres, tubes, plate glass etc. Others include electrical materials, components and batteries. Alloy steels and proper quality of steel sheets for the body are not yet available in the country and so also many of the non-ferrous metals. Similarly, the right type of glass and many other non-metallic materials are also not easily available. The difficulty with regard to the availability of raw materials indigenously stands in the way of the proper development of the car industry in the country.

3.10. The complexity of the movement of raw materials, components and sub-assemblies to the car manufacturers, from different industrial sectors, necessitates a sound purchase policy if a regular flow is to be ensured and production schedules kept up. The same holds good between the ancillary producers and their suppliers. The purchase policies, however, vary among different units depending upon the nature of their activities. This subject has been dealt with in detail later on but suffice it to mention, at this stage, that better development and economic production of quality goods can come about only if the purchasing is more equitable and businesslike.

3.11. The Committee has endeavoured in later Chapters to discuss in more detail the various aspects of the matters briefly mentioned in some of the paragraphs above, where ways and means have also been suggested, for removing the bottlenecks and imbalances which are collectively hampering the growth of the ancillary industries and finally of the car industry itself. Although, for various reasons, the automobile industry has not yet made a big impact on the economy of the country, as is the case in the other advanced countries like U.S.A., U.K. West Germany and Japan, nevertheless the seeds of growth are well planted. The persistent demand for the small car shows the trend.

CHAPTER 4

QUALITY OF CARS MADE IN INDIA

4.1. There is no gainsaying the fact that India-made cars today leave much to be desired. To a very large extent the present state of affairs is the natural result of an unhealthy market condition in which there is hardly any motivating force for maintenance of quality. Some of the troubles also arise from the unsuitability of component designs to prevailing operating conditions, namely, the state of the roads, weather and atmospheric conditions, driving habits etc. A few of the troubles are clearly the end result of manufacturing techniques and processes. The Committee's investigation shows that not only the car manufacturers themselves but also their ancillary suppliers and dealers share, in varying degrees, the responsibility for the present user dissatisfaction.

4.2. In the course of its enquiry, the Committee observed that quite a few defects are already present in the new car, at the time it is purchased and manifest themselves as it is put to use. Most of the defects arise during the warranty period. This is not to say that trouble is not being experienced by users thereafter, but it is more likely that the data available with the dealers for such cases is not complete, due to the users having shifted patronage to other servicing agencies. The customer dissatisfaction arises not only from the defects but also from the way in which these are dealt with by the dealers during the warranty period. Further, the factual data relating to defects observed at the time of purchase and during the warranty period—when the car would be expected to operate with minimum trouble—are in themselves adequate to confirm the conclusion that the quality of the vehicles now being made leaves much to be desired.

4.3. The Committee have analysed in some detail the performance of the three makes of cars during the warranty period. The complaints have been summarized under the following ten main groups:

Body.
Engine,
Gearbox,
Transmission,
Suspension.
Steering,
Brakes,
Instrumentation,
Electricals, and
Miscellaneous.

The summary of the complaints per 1000 cars, as assessed from the information given by the car makers, modified to the extent any changes became necessary, in the basis of the replies received from the dealers and the users, is given in Appendices C, D and E.

4.3.1. The figures in the appendices show that there has also been a significant increase in the volume and nature of complaints during the last 2-3 years.

4.4. There is hardly a new car which, at the time it is offered to the customer, does not have defects which could easily have been rectified at the car makers' works with little effort and no extra expense. Door rattling and hard closing, poor finish of paint, defective switches, slipshod finish of body trim, and improper alignment of body components are but a few of the defects easily noticeable in the dealers' showrooms. Such defects, though they may not affect the performance of a car, act as irritants and need never have been present if the manufacturer or his dealer had been more attentive to the details and keen to please his customers. It is to be admitted that present day car prices are completely disproportionate either to the price paid or to the general buying power of the customer. These factors only tend to further magnify the defects and troubles in the mind of the user.

4.5. While it has to be accepted that there can be no engineering product—particularly a complicated one such as a motor car—which would not, at one time or another, develop some minor defects calling for attention, the trouble with the cars being produced in India is that a whole host of such defects and troubles manifest themselves at too early a stage in the life of the vehicles. Some of these troubles, like stiff steering on the Ambassador or the distortion of the engine hood in the Fiat or early tyre wear on the Standard Herald are, to some extent, influenced by inadequacy of basic design for prevailing operating conditions. On the other hand there are many defects such as smoky engine, excessive oil consumption, early deterioration of paint and failure of electrical fittings, which are the end result of poor workmanship and inadequate quality control at the time of manufacture and assembly.

4.6. Defects in an engineering product, such as a car, can arise due to a number of reasons which may broadly be grouped as follows—

(i) Defective designs; (ii) Defective raw materials. (iii) Defective components obtained from other manufacturers; (iv) Defective manufacture in the car makers' plants; (v) Improper usage; and (vi) Inadequate maintenance.

4.7. The three vehicles currently being produced in India are to the designs developed and adopted in other countries by reputed manufacturers. There is no basic design deficiency in these vehicles, although there are components which need to be examined for their suitability to the prevailing operating conditions in India. For example, the loading and road conditions in the country point towards the need for the strengthening of the suspension systems adopted in those vehicles. The elimination of door sealing rubbers may have gone unnoticed in smooth roads and temperate climates but it is causing difficulty with regard to door rattle, as well as ingress of dust, in the conditions prevailing in the country. Even some parts of the body call for strengthening due to the user habits.

4.8. The Committee has seen evidence of the use of defective raw materials which, at times, have led to serious defects. For example, there have been cases of rear axle breakage which, on investigation, was found to have been caused by piping and inclusions in the raw material itself. A more stringent inspection of raw materials required for such a vital component would minimize such failures.

4.9. The Committee's examination reveals that defects in manufacture of components processed by the car makers are largely in respect of such components where manual work predominates. Where dimensional and process accuracies are largely dependent on machines, the troubles are relatively fewer.

4.10. A large number of complaints result from faulty manufacture and others negligence at the car makers' plants. There have been complaints of defective window regulators either due to inherent defect in their manufacture or due to incorrect fitment of the window channels.

4.10.1. There have been serious complaints against paint work in respect of all the three cars. While the car makers maintain that this is largely due to the poor quality of paint materials which they have been receiving in the recent past, the Committee found considerable evidence of imperfect protection of metal surfaces and inadequate precautions during the processes of painting. Little attention appears to have been paid to proper pacification of the surfaces before application of the primer, adequate provisions to ensure completely dust proof areas when the various coats of paint are applied, and necessary precautions to ensure that high humidity conditions do not affect the paint during the stages of application. All these lead ultimately to an early failure of the paint. The position is of course aggravated when the paint materials also happen to be of poor quality.

4.10.2. The car makers are manufacturing the complete gear box in their own plants. Defective gears, incorrect machining, ineffective synchro-meshing, hard engagement, etc. are the direct result of inadequate and improper attention in the manufacture of individual gears and their assembly.

4.10.3. It has been claimed that leaky gaskets are due to defective gasket material. There is evidence that this trouble has been caused in many instances by incorrect tightening of cylinder head bolts and and to poor finish of the matching surfaces. This is one of the many cases of passing blame on to others.

4.10.4. Improper attention to apparently minor matters may ultimately lead to serious consequences. For example, the steering box cover in one of the cars is secured by four set screws but without any locking device. These set screws are working loose and there have been a number of cases of the cover plate falling off in service, leading to complete loss of steering control, which can lead to serious consequences. The Committee was unhappy to note the casual attitude of the car maker in respect of this defect. In fact, it was mentioned to the Committee that the number of such cases reported was not large enough to warrant serious attention!

4.11. While the Committee would refrain from remarking that there is a total lack of quality consciousness in the higher echelons of management of the car makers, it cannot help but state that there is inadequate awareness and utilization of the modern tools of managerial control required for quality production. In fact, the Committee was pleasantly surprised to observe that in some of the ancillary units there is greater consciousness of quality control, as an aid to increase in production and reduction in costs. The Committee during its investigations found little evidence of top management in the car plants receiving complete and regular information, designed to appraise them of the position obtaining in the plants and stores, which could enable them to take the necessary steps to maintain the quality of the end-product. The Committee was in fact left with the impression that most managements—both in car makers' plants as well as in many of the ancillary units—are labouring under the mistaken belief that a quality product would tend to increase production costs. It has now become more or less axiomatic that adoption of statistical quality control methods normally leads to lowering of production costs.

4.12. Some of the defects no doubt arise from inadequate developmental work preceding large-scale manufacture. While the Committee is conscious of the pressure on the car makers to build up the indigenous content as rapidly as possible, it has been unable to appreciate the evident lack of pre-planning of development activities. It appears that only when the pressure of circumstances and the threat of a total shut down manifested themselves did the car makers and the ancillary manufacturers seriously take up, for consideration, the production of a number of components. The Committee also observed that quite a large proportion of components, against which there are widespread complaints at present, were deleted from import long ago. For example, rubber fittings have been of indigenous origin for many years. It is difficult, therefore, to accept the position that trouble with rubber components is due to rapid indigenization. The Committee is of the view that some of these troubles are the direct outcome of manufacturers attempting to purchase primarily on a price basis, with inadequate emphasis on quality of the product.

4.13. While detailed procedures for inspection and quality control have been laid down by the car makers, the Committee observed that in many cases the quality controllers were themselves not clear about the standards to which they were required to work. In one case, an Inspector did not know the end-play to be provided while fitting the connecting rod to the crankshaft. Another inspector was not sure of the range within which the oil pressure must be held during the testing of an engine.

4.14. In one of the car plants the Committee observed that the differential testing equipment was installed within a small booth, wholly inadequate for the purpose. The working conditions in the booth were certainly not conducive to proper checking and quality control.

4.15. While generally accepting that there has been a deterioration in the quality of the cars being produced by them, all the three car makers maintained that the primary cause of his was the receipt of sub-standard raw materials and products from their suppliers. The Committee is unable to appreciate this attitude since the acceptance or rejection of supplies made to them is a matter entirely within their own control. That the schedule of work in their assembly lines would be adversely affected can be no excuse for using bad materials and components.

4.16. During its investigations the Committee found sufficient evidence pointing to the fact that the car makers are not paying adequate attention to proper inspection and checking of components and materials when they are received. The manufacturers have made available to the Committee details of the procedures laid down by them for such control. Actually, however, there is considerable variation between precept and practice. When attention was drawn to such a state of affairs, an adventitious mention had even been made of the fact that defective components would after all be replaced during the warranty period. There is little hope of the troubles arising from this source being reduced unless the car makers insist on more rigid quality controls, both in their ancillary manufacturers' works, as well as at the time of acceptance of supplies. Cases were brought to the notice of the Committee where supplies were being obtained from ancillary manufacturers who do not themselves have adequate testing and quality control facilities. Placing of orders on such manufacturers without first ensuring their capabilities must naturally lead to the troubles now being experienced.

4.17. The Committee has given only illustrative examples in the above paragraphs. A more detailed analysis of the defects of each car has been done in the subsequent Chapters. Short and long term measures for improving the quality of cars have also been indicated in a subsequent Chapter.

CHAPTER 5

THE AMBASSADOR CAR· GENERAL

5.1. M/s Hindustan Motors Ltd., Calcutta, incorporated in 1942 commenced assembly of passenger cars in 1946 in collaboration with M/s Morris Motors Ltd. of UK. They started the manufacture of Bedford Trucks in 1958 in collaboration with M/s Vauxhall Motors of UK. In 1956 they had also entered into collaboration with M/s Studebaker Corporation of USA for the manufacture of Studebaker Cars, but this was later given up. In the category of cars the company is now producing only the Ambassador Mark II.

5.1.1. Initially the Company had taken up the assembling of Hindustan 10 and Hindustan 14. It was the first Indian Company to take up the manufacture of components and put on the road the first car with indigenous components in 1951. These models were superseded by the Hindustan Landmaster in 1954 and the Hindustan Ambassador in 1957. The production of the current model, Ambassador Mark II, commenced in 1963. The collaboration agreement with Morris Motors under which they were to produce this vehicle expired in January 1966.

5.2. The Company has a President in overall charge and four Vice-Presidents in charge of the Auto, the Non-Auto, the Finance and the Economic Development Departments. Managers are in charge of personnel, supplies, and merchandising. Amongst the senior executives may be mentioned the Chief Engineer, two Managers in charge of Mechanical and Sheet Metal Departments, and one in charge of Quality Control. Under them are the usual executive and non-executive personnel, skilled and unskilled workers. They have 20 foreign technicians in service with whom Indian technicians have been placed as understudies.

5.3. The Company has instituted training schemes for executives, apprentices, foremen and dealers' service personnel. Training facilities are also provided for other Government apprentices from time to time and a short term, training course is run for students from technical institutions and colleges.

5.4. The level of production of cars achieved since 1963 has been as under:

Year			*Number of cars produced*
1963	...	...	8,621
1964	...	...	15,351
1965	...	...	15.558
1966	...	...	19,469
1967	...	...	16,465 (Upto October)

5.5. M/s Hindustan Motors manufacture in their own factory the body, engine, gear box, transmission and suspension, thus covering most of the major sub-assemblies. They have their own foundry and forge shops.

5.6. The Company has gradually developed the manufacture of various major components in their own works or with the other ancillary producers. Some of the major items which they obtain from the ancillary industries are some engine parts, clutch, propeller shaft, brakes, shock absorbers, door and window regulators, instruments, all the electrical items, wheels, tyres, tubes and batteries. Only a few components such as carburettors, some fasteners and bearings are now being imported. Statistics furnished to the Committee regarding the value of the components made in their own factory, those purchased from the ancillary producers, and those at present imported are given in Table 1. It will be seen that the indigenous content achieved is almost 93 per cent now.

TABLE 1

Percentage Value of Components made in India and Imported

Serial No.	Components	1962-63	1963-64	1964-65	1965-66	1966-67
		Per cent	Per cent	Per cent	Per cent	Per cent
(*i*)	Made in the factory ..	52·92	54·85	54·25	58·63	62·13
(*ii*)	Purchased from ancillary producers	21·70	29·67	30·24	31·54	35·62
(*iii*)	Total indigeneous content ..	74·62	84·52	84·49	90·17	97·75
(*vi*)	Imported	25·38	15·48	15·51	9·83	2·25

5.7. In the category of raw materials they still import steel sheets for body panels, special alloy and tool steels, some non-ferrous metals and a few chemicals.

5.8. They are basically following the British Motor Car Corporation (BMC) Standards. In the case of raw materials other equivalent standards, Indian and overseas, are also used for procurement from different sources. For components standards other than BMC are in use especially for the proprietary items.

5.9. In the Quality Control Section, the Manager is directly responsible to the concerned Vice-President and is in turn, assisted by a Chief Inspector and an Assistant Chief Inspector. The Chief Inspector, in addition to his overall responsibility as head of the quality control organisation, is directly in charge of the Sheet Metal Division, the Car Assembly Division (Body Assembly Paint, Trim, Chassis Erection line and Testing) and the incoming Materials Inspection Division. The Assistant Chief Inspector supervises the quality control work in the Mechanical Division which is sub-divided into Axle & Transmission, Engine Plant, Foundry, and Forge Sections.

5.9.1. It was indicated that they need certain additional equipments for quality control, as given in Appendix F.

5.10. They have established chemical, metallurgical, and mechanical testing laboratories. There is also a metrology section for checking tools and gauges. There are some rigs for testing some of the major sub-assemblies such as the engine, the transmission, and the differential. There is a separate Research and Development Department which also looks into the causes of defects. This Department is expected to develop improved designs. They have recently completed a test track for conducting accelerated tests on cars and components.

5.11. The car maker has indicated that the fuel consumption on an average comes to 9 Km/litre (25 MPG) and that there have been cases when the figure of 10.5 Km/1 litre (30 MPG) has also been reached. The oil consumption of one litre per 700 Km (1 gall./2000 miles) was considered reasonable. It is surprising that the car maker has not determined certain fundamental performance characteristics such as oil and fuel consumption in respect of his vehicle as he merely referred to the performance figures reported to him by the users.

5.12. The details of the warranty for the car and the dealers are given elsewhere in the Report.

5.13. Cars are sent to the dealers generally by road under a convoy system and the responsibility for transportation lies with their dealers.

5.14. As an austerity measures the Government of India advised that the use of stainless steel should be stopped and, therefore, the following stainless steel fittings have been replaced by aluminium and, in some cases, by mild steel—

(a) beading around the windscreen,
(b) mouldings around back light and door openings,
(c) radiator grill,
(d) quarter glass frame,
(e) vertical channels of front and rear doors.

5.14.1. The foam rubber seats have been replaced by rubberized coir and the clock has been eliminated.

5.15. The Committee had issued a number of questionnaires to the Company for eliciting factual information as well as getting the considered opinion of the top management on subjects like operational management, inspection of materials and quality control, user complaints and their redressal, their own difficulties, and needs. The Committee discussed their replies and problems with the Chairman, the President and other senior officers. Discussions mainly centred round the growing customer dissatisfaction and improvements required in the quality of the cars.

5.15.1. During the discussions attention of the Committee was drawn to newspaper reports that, even in the cars made in UK and USA, a number of faults to occur as soon as the new cars are put on the road. While this may be so, the Committee felt that for the conditions obtaining in this country these points had hardly much relevancy. Firstly, the models in those countries change very frequently with new design features. Secondly, in those countries complaints are more promptly attended to and corrective measures taken immediately in view of the keen competition. Finally, the volume of production here is comparatively so small that greater attention should be possible while the cars are being manufactured.

5.16. With regard to the question whether price decontrol would assist, the management felt that it would help improve the quality of the cars to some extent as this will enable them to effect improvements. They also suggested that the dealer ought to have a better incentive as it will motivate him to expand and modernize his organization so that he can offer increasingly good after-sales service. They, however, did not think that the abolition of distribution control will have any direct effect on the quality of cars.

5.17. In the next Chapter the extent and nature of complaints covering the Ambassador Cars have been dealt with in some detail and comments have also been made on the production techniques and quality control methods in vogue.

CHAPTER 6

THE AMBASSADOR CAR. ANALYSIS OF COMPLAINTS

6.1. The Committee had asked the Hindustan Motors appointed question whether there had been a deterioration in the quality of the cars being produced by them. They agreed that this was so, but contended that such defects arose mainly because some of the ancillary producers had neither fully developed their production capability, to meet the growing requirements of the automobile industry, nor did they have the right equipment for the manufacture and testing of the components produced by them. In support of their contention they gave a list of 26 items supplied by ancillary producers (Appendix G) wherein defects had been noticed by them. The other reasons given were that the labour was becoming progressively careless and did not have the required degree of quality consciousness, the equipment used in their own plant was old, due to which production was not of uniform quality, and the foreign exchange provided to them for getting their requirements of machine spares to keep their equipment in proper shape was meagre. They complained that their requests for getting foreign technicians and sending their own staff abroad for training have often involved considerable delay in the past. It was also pointed out that the car maker is being blamed for defects arising from bad road conditions, poor maintenance facilities, neglect of regular service of cars by the owners, lack of knowledge and negligence of the drivers. The Committee felt that there was some substance in these arguments.

6.2. The extent of the complaints in a way can be judged by the number of warranty claims which they have settled during the last five years. These are given in Table 2 and show a rapid increase in the warranty claims during the last 2 years.

TABLE 2

Warranty Claims Settled Year-wise

Serial No.	Year	No. of cars produced	Claims settled		Amount Rs.
			Total Number	Per 1000 cars	
(*i*)	1962-63	12,000	18,502	1,542	10,90,136
(*ii*)	1963-64	10,699	13,577	1,269	8,49,838
(*iii*)	1964-65	16,000	20,549	1,284	8,08,017
(*iv*)	1965-66	16,500	25,095	1,521	13,90,132
(*v*)	1966-67	20,001	43,267	2,163	19,38,217

6.3. It was argued by the management that the complaints made against the components produced by them are considerably lower compared to those made against the components bought out. It was also pointed out that while the percentage of complaints against the components they make was going down, those against the components bought out were going up. In support of these arguments, the statistics as given in Table 3 were furnished.

TABLE 3

Complaints about Components Produced in Factory and by Ancillaries.

Serial No.	Year	Cars Produced	Components produced in terms of ex-factory value			Complaints against components (Col. 4&5)	
			HM items Per cent	Ancillary Per cent		Total No.	Per cent
1	2	3	4	5		6	7
(*i*)	1962-63	12,000	52·92	21·70	HM Items	4,658	30
					Anc Items	10,512	70
					Total	15,170	
(*ii*)	1963-64	10,699	54·83	29·67	HM Items	3,261	25
					Anc Items	9,724	75
					Total	12,985	
(*iii*)	1964-65	16,000	54·25	30·24	HM Items	4,505	22
					Anc Items	16,001	78
					Total	20,506	
(*iv*)	1965-66	16,500	58·63	31·54	HM Items	6,877	23
					Anc Items	23,653	77
					Total	30,530	
(*v*)	1966-67	20,001	63·13	35·62	HM Items	7,409	21
					Anc Items	26,791	79
					Total	34 200	

6.4. The Committee, however, feels that the above is not a correct comparison. It should be based on the number of items rather than their value. It should also be noted that Hindustan Motors established themselves much earlier than the ancillaries and, therefore, there should not have been so many complaints against the components which they have been manufacturing all these years

6.5. The Table at Appendix C reveals that, in the case of this car, the extent of complaints in respect of the body, transmission, brakes and instruments have varied only marginally during the last 5 years. There has, however, been a very marked change in the pattern and extent of troubles in respect of the engine, gearbox, suspension, steering, electricals and miscellaneous items.

6.6. *Body*—The main defects are mismatching of panels, rattling of doors and bonnets, poor welding and early rusting.

6.6.1. The press dies are considerably worn out as they have been in use for 12 years now. The locating points and certain deep drawing profiles are particularly affected. In the absence of trimming dies, press trim of profiles is not being done, but edge trimming is done with conventional tools like rotary shears and band saws. Panel edges are, therefore, distorted leading to improper lapping and fitting. Frequent use of hand hammers in such circumstances merely

6.6.2. The spot welding fixtures are worn out. Also the spot welding guns in use are old and unable to ensure constant weld quality This is further aggravated by non-availability of proper quality welding tips in the local market. There is no means of controlling spot welding pitch which results in workers welding in a haphazard manner. With this particular design of an integral body, proper alignment of locational points is vital. There is no means of checking the alignment of the composite body. Cumulative errors in fixation of individual panels, doors, etc., cannot, therefore, be controlled.

6.6.3. Unless these shortcomings of equipment are set right and more rigid stage inspection insisted upon, complaints in respect of the body would continue to persist.

6.7. *Engine*—The main defects which have been occurring in the engine are excessive oil consumption and early smoking. Both these troubles stem from incorrect matching and fitting of pistons and rings. Although the firm has commissioned a transfer line for the machining of the cylinder blocks, their tooling up technique has not yet been brought up to the required standards. During the Committee's inspection it was observed that in some cases the "no go" gauge was passing through the finished cylinder bore.

6.7.1. The firm is buying piston castings from external sources and machining them in their own plant. The concerned machines are now worn out and piston dimensions are not being rigidly controlled. In the long run the better course for the firm may perhaps be to discontinue machining of pistons and buy them from one or the other of the firms who are already well established in this field.

6.7.2. The present procedure for testing the engines on the test stands is apparently ineffective. One would expect that with the complaints being received, the firm would have ensured a more rigid test of the engine on the test stands, particularly with regard to torque development, oil pressure checking and temperature recording at stipulated engine speeds. The running period of the engines on the test stands also needs to be substantially increased. It was observed that the test records are incomplete and explanation given was that wherever there is no remark by the inspectors it is assumed that that item is correct.

6.8. *Clutch*—There are continuing complaints of clutch shudder. Both the car maker and the clutch manufacturer have attributed the trouble to a variety of reasons including improper spring compression, incorrect alignment of clutch pressure plate, incorrect material composition of clutch lining etc. This is a case where trouble can be eliminated by joint investigation by the car and clutch manufacturers.

6.9. *Gearbox*—Apart from the trouble with the gear shift linkage there are many complaints of improper and/or difficult gear engagement. Inadequate attention is being paid to deburring and final touch up of individual gears after machining. Tooth contact checking is also not being done except in the case of the differential crown. Lapping of important gear clusters, particularly those which are most frequently in engagement, is also not being carried out.

6.9.1. The assembled gearbox is being tested in the open shop where the gear noise level cannot really be determined. Better results can be achieved only if the running-in-facilities are housed in a sound proof enclosure. The gear shift linkage has been giving a lot of trouble primarily due to breakage of gear change lever. This lever has since been redesigned and the firm expects to overcome this trouble now. The finishing of the matting surfaces of the gear shift linkage mechanism is also not adequate.

6.10. *Transmission*—A common complaint on this make of car has been the hum in the rear axle differential. Not only is this caused by inadequate control on housing alignment during machining, but the very design itself makes no provision for checking the assemply once the gear train is asembled into the housing. The present practice is to make a trial assembly on a separate housing to check the back lash. There is no means, however, of being certain that the observed back lash holds good when the gear train is reassembled in the differential housing of the car. Further, the equipment for testing the differential assembly has been out of commission for some time and this test is currently not being carried out.

6.10.1. The first atempt by the car manufacturer to tackle this problem was around 1961-62 when they replaced the ordinary ball bearings by angular contact bearings. Since then, work has been going on and the Committee was shown the prototype of a new design of differential which the firm now intends to introduce to get over this complaint.

6.11. *Steering*—The steering has been the target of complaint from the very beginning. The steering rack is supported on brackets mounted on the chassis cross member and the steering column on the panel frame. Operation is likely to be adversely affected if relationship between the chassis cross member and the panel frame is not true. While this may be a contributory factor, the main trouble and dissatisfaction stem from the unsuitability of the design of the rack and pinion arrangement in this relatively heavy vehicle, coupled with prevailing road conditions in the country.

6.11.1. It is not possible to readily alter the design without taking up a major redesign of the suspension, engine mounting etc. The firm has recently introduced spring loaded ball supports to reduce rattle. It remains to be seen to what extent this will help.

6.12. *Suspension*—The analysis shows that there has been some improvement in this regard although complaints still persist in respect of bad wheel alignment and the rubber mountings. The manufacturers were initially facing certain difficulties regarding the torsion bar which they now seem to have overcome. Not only is it necessary to pay greater attention to wheel alignment by the car makers, but it is also essential for the dealers to carefully check this again before delivering the cars to customers. Customers should also get the wheel alignment checked from time to time in acordance with the maker's recommendations.

6.13. *Electricals*—There has been a serious increase in the complaints relating to electrical fitments. By and large, these relate to defective switches, fuse boxes, poor quality bulbs, and short-circuiting due to defective wiring harness. All these electrical components are supplied by ancillary manufacturers and they must accept responsibility for such deterioration. At the same time, the Committee has observed that the car makers themselves have done little to tighten inspection at the time of acceptance of goods. More extensive and intensive checking of such components at the time of acceptance, particularly with regard to functional aspects, would undoubtedly filter off a large proportion of the defective supplies.

6.13.1. The ancillary producers are not always able to get proper non-ferrous materials and, therefore, in certain cases where a phosphor bronze forging is more desirable brass material is being used, resulting in early deterioration of the component.

6.14. *Miscellaneous*—There is a whole host of defects relating to relatively less important components and the general get up and finish of the vehicle.

6.14.1. *Painting*—Mention has already been made about the improper surface preparation for painting. There is, in addition, complaint against the defective supplies of paints and paint materials. The Committee have also observed lack of adequate attention at the time of the unavoidable paint retouching. There is no evidence of attention, even by the inspectors passing the vehicle, to see that excess paint on surfaces, particularly rubber and plated parts, is properly removed. It is an example of lack of attention to detail.

6.14.2. *Door Locks, Door and Window Regulators*—Inconsistent raw materials, inadequate facility for heat treatment of rapid wearing components, and use of gravity diecast components (instead of pressure diecast components) are leading to sub-standard quality. Particular attention must also be given to fastenings protected against corrosion where dimensional control prior to galvanizing/plating requires to be followed more rigidly. Introduction of functional inspection rigs would ensure better quality.

6.14.3. *Rubber Parts*—There has been a general deterioration in the qualtiy of rubber parts of the car. Weather strips, suspension and engine mountings are causing trouble. Here again, it appears necessary for the car manufacturer to enforce standards.

6.14.4. An investigation should be carried out to ascertain whether the raw material for the rubber products received by the ancillary manufacturers are of consistent quality. Particularly, for all the weather cords required for wind shields and rear view glasses it is essential that the cross sectional dimensions are consistent throughout and that they retain their shape.

6.14.5. *Oil Seals*—There are numerous complaints against defective oil seals. During discussions with the ancillary manufacturer the Committee was informed that this was due to defective springs.

6.14.6. *Wind Screen*—There are complaints of waviness in the glass. This is due to use of sheet glass instead of plate glass. This trouble can only be obviated if the windscreens are manufactured only from plate glass. Till such time as plate glass is made available a refraction test should be carried out by the glass manufacturers and car makers to minimize the present problem.

6.14.7. *Service Tools*—There is a general complaint against the Ambassador as well as the other cars that the service tools supplied are of poor quality and performance. Often even all the tools given in the list are not supplied along with the new car.

6.14.8. *Minor Details*—Lack of attention to a variety of minor details such as correct alignment of radiator grill, loosely fitted window channel moulding clips, front door closing straps, fixing of floor matting etc., are further example of shoddy workmanship with no financial advantage to the manufacturers.

6.15. Some of the troubles which users are experiencing with the vehicles arise out of improper handling of the vehicles during the transport from manufacturers' works to dealers' show rooms. They are fitted with governors which are inadequate for the purpose for which they are meant. The engines and transmissions being hardly run-in when the vehicles leave the manufacturers' works, very considerable damage can be done to such vital elements during the first 1000 miles of operations.

6.16. It will not be out of place to examine in some detail the quality control practices obtained in the Hindustan Motors Plant.

(a) For incoming imported raw materials, test certificates are received which are recorded by the Incoming Inspection Section. In case of doubts, test pieces are subjected to Central Laboratory tests, otherwise the imported raw materials is accepted on the basis of the test certificates. For indigenous supply of raw material, percentage check is carried out by the Central Laboratory. Dimensional check is caried out for all indigenous and imported raw materials. All requests to the Central Laboratory for tests are forwarded through a request form and records of the findings are maintained. Regarding deviations, if any, the claim settlement is done through the Purchase Department.

(b) Finished and semi-finished parts received from outside suppliers and manufacturers are checked in detail for dimensional and functional correctness only in respect of the first sample. Once the samples are accepted from a particular source and the supply order is placed, only random sampling for dimensional accuracy is resorted to. Depending upon the past performance of a particular supply, laboratory tests are also conducted occasionally. A major part of the ultimate trouble being experienced are due to inconsistent quality and inadequate screening of bought-out parts at this point. Detailed inspection procedures for acceptance of various bought-out components, indicating the system of dimensional inspection, functional tests and allowable deviations have not been introduced in all cases. This is vital and needs to be done urgently. More rigid and extensive inspection of supplies including functional testing, particularly of such parts which are giving trouble, would help considerably in preventing acceptance and use of sub-standard products from external sources. Minimization of clerical paper work which is now being done by the inspectors in this particular section, may be given some thought so that the existing inspectors may devote more time to technical work.

6.17. Stage inspection procedure for process shops, such as forge, foundry, gear machining, engine machining, etc., have been laid down but need to be considerably improved. Furthermore, it has been observed that even the laid-down practices are not being strictly adhered to.

6.17.1. Adequacy of control gauges and of surface crack detection facilities are not available in the forge shop. In view of the fact the alloy steel heating is done in oil-fired furnaces which are not equipped with temperature control equipment, provision of adequate inspection facilities for forgings are all the more necessary.

6.17.2. While individual gears are being checked, tooth contact checking is not being done except in respect of differential crown gear and pinion. It would be advantageous to set up an appropriate view bay for carrying out various checks necessary during large batch production of gears. For this purpose, certain re-arrangements on existing gear testing equipment and some additional equipment would be necessary so that lead error, pitch line run out, involute error, composite back-lash, etc., may be carried out on a percentage basis and records to this effect properly maintained for each batch production. Introduction of engineering standards for gear inspection in a more detailed and specific manner would help the inspectors concerned.

6.17.3. By and large, the percentage on-line inspection at various points should be increased. One of the drawbacks here seems to be the inadequacy of recorded data of inspection without which managerial check on quality is more or less based on impressions and discussions.

6.18. As far as body pressings are concerned, there is practically no facility for carrying out inspection of individual pressings even on a percentage basis. For this purpose, it is desirable to set up adequate facilities by providing master checking fixtures for important pressings.

6.19. The plant facilities include a few semi-automatic lines which are mostly equipped with pneumatic gauging facilities. Introduction of appropriate and detailed engineering standards for inspection, more frequent control on larger percentages, would lead to better results since these lines were set up very recently and there are still some initial teething troubles.

6.20. Mass production techniques have been more or less adopted in various sections and, therefore, production of appropriate history card system for each major tooling would be of advantage, to ensure better control.

6.21. Checking by inspectors on the Assembly Lines leaves very much to be desired. Obvious defects are allowed to move on. Sometimes these are attended to at a later stage, which entails considerable additional expenditure for rectification. This position naturally influences final judgment with regard to ultimate passing of a particular item/sub-assembly. Introduction of definite inspection procedures detailing the latitudes for relaxation and maintenance of records to this effect must be instituted.

6.21.1. Procedure for checking body and door rattles, control of alignment on important dimensions, carrying out of gear box and differential tests in sound-proof compartments, and testing of engines for a longer period, should be introduced for better quality control.

6.21.2. Rigid inspection of surface preparation prior to painting better control of sealing of joints after welding, and increased number of stage inspections on trim line, with particular regard to fastening techniques, would provide better results.

6.21.3. Facilities for functional testing of various indigenous supplies required for the trim line, need to be developed still further. A few functional tests are now being carried out for certain electrical fittings, oil filter etc., but stress must be laid still further to cover more items, particularly rubber and electrical items, till such time the quality of ancillary supplies comes up to a reasonable level.

6.22. Engineering procedures for road test of vehicles after complete assembly should be laid down in detail indicating the manner and yard-sticks for functional checking of each major sub-assembly. These check reports and deviations observed, if any, should be brought to the notice of the higher management so that managerial action for improvement of quality may be initiated if necessary.

6.23. There is no organized procedure for reporting of performance and analysis thereof. The Company does not appear to have taken any action so far to introduce modern techniques of quality analysis as an aid to management. Statistical quality control is now a well recognized procedure and it is vital that a systematic review of the data collection, correlation analysis and action procedures made. Use of frequency charts would enable management to determine paridicity of quality variation occurrences. This part of the subject has been dealt with in greater detail in Chapter 13 on 'Quality Control'

6.24. In this chapter and in the last one, the Committee has gone into some detail on the defects of the Ambassador Car, their organisation, working methods and what is obviously lacking in respect of inspection and quality control. Being the first in the field and manufacturing the largest number of cars, the Hindustan Motors should set the pace for immediate improvement in the quality of the cars they produce. The Committee feels that if the suggestions made above are implemented, not only will they be able to produce better components themselves but purchase better bought-out items and put them together well and deliver a much better car to the user.

6.25. In the following 4 chapters, the Committee has dealt with the Fiat and the Standard Herald cars. The Committee has been brief and has deliberately avoided repetition of the common features. It should not, therefore be construed that since no specific mention has been made of certain shortcomings, these do not exist in the other cars.

CHAPTER 7

THE FIAT CAR: GENERAL

7.1. M/s Premier Automobiles Ltd. Bombay, were established in the year 1944. They secured a licence for the manufacture of the Fiat 1100 car in collaboration with M/s Fiat Societa Per Azini, Italy, in 1953. Earlier in March, 1947, they had entered into a collaboration with Chryller Corporation of USA to manufacture Dodge/Fargo commercial vehicles. Later, in 1955, they entered into a collaboration with M/s. Rockwell Standard Corporation of USA for the manufacture of Axle Assemblies, and in 1962 with Henry Meadows of UK for the manufacture of Meadows diesel engines. In the category of cars the company is now only producing the Fiat 1100 Delight model.

7.1.1. From 1954 to 1964 under a phased programme of manufacture of cars they produced different models, namely, 1100-103A, 1100-103B, 1100 Elegant, 1100 Select, and 1100 Super Select. In the year 1964 they introduced the Fiat 1100 Delight model. Their agreement with M/s Fiat of Italy stands revised and renewed upto June, 1971.

7.2. Plant facilities have been established at three places viz. Kurla, Wadala, and Kalyan, all in the Bombay area. The Kurla plant is the main unit which manufactures the body, engine, gearbox, transmission and suspension, thus covering all the major assemblies. The facilities at Kurla also include a forge shop and their foundry is at Wadala. At the Kalyan Plant they have a modern Press Shop for pressing body and other panels.

7.3. The General Manager is in overall charge. For the main Kurla plant he is assisted by 4 Controllers of Production, Technical services, Materials, and Accounts & Administration, and has a Deputy General Manager under him for marketting. The Kalyan factory is under a Plant Manager. They have the usual set of staff and workers of various grades.

7.4. They have instituted training programmes for apprentices, service mechanics, service representatives, supervisory staff and junior engineers. They have also instituted development courses for superintendents and senior executives.

7.5. The level of production of cars achieved since 1963 has been as under:—

Year	*Number of cars produced.*
1963	3,750
1964	3,867
1965	5,673
1966	7,030
1967	8,395 (Upto 31 October).

7.6. Apart from the manufacture of major components and sub-assemblies, they also buy many components from the ancillary industry and import a few items. Some of the major items they obtain from the ancillary industry are pistons, clutch, brakes, all the electrical items, instruments, wheels, tyres, tubes and batteries. What they themselves manufacture, what they purchase from the ancillary industry, and what they import are given below in Table 4. It will be seen that the indigenous content achieved is 97 percent now.

TABLE 4

Percentage value of components made in India and imported

Serial No.	Components	1962-63	1963-64	1964-65	1965-66	1966-67
		Percent	Percent	Percent	Percent	Percent
(*i*)	Made in the factory ..	37·05	41·29	45·07	46·10	51·23
(*ii*)	Purchased from ancillary producers	24·90	25·60	30·07	37·63	45·94
(*iii*)	Total indigenous content ..	61·95	66·89	75·14	83·73	97·17
(*iv*)	Imported	38·05	33·11	24·86	16·27	2·83

7.7. The collaborator's standards for components, sub-assemblies and the final car are followed. For raw materials, Collaborator's Standards, Association Standards, and Indian Standards are used in that order. As far as imported steel is concerned, they receive test certificates for each batch from the suppliers but in case of doubt, laboratory checks are made and records to this effect are maintained. Semi-finished products and other indigenous supplies are accepted on the basis of their inspection procedures which indicate dimensional control and functional performance. Regular check-lists have been issued for all the items. Stage inspection facilities in the engine block and cylinder head manufacturing section comprise mainly of snap and plug gauges and a few pneumatic gauges. Detailed technical procedures for their inspection and stage inspection procedures for forge, machine shops, body assembly and trim line have also been laid down. The assembled car is tested on rollers. A few cars are also periodically taken out for road tests.

7.8. Their Inspection Departments at Kurla and Kalyan are headed by the respective Chief Inspectors under the Controller of Technical Services. At Kurla they have five Inspection Divisions and four Quality Control Cells. Each Division is headed a Deputy Chief Inspector and each Cell by an Assistant Chief Inspector. They are assisted by Assistant Chief Inspectors, Inspection Officers, Inspection Supervisors and trained Inspection Assistants. The Inpection Department has adequate personnel and sufficient equipment considering the volume of production for functioning effectively but they are not deployed effectively.

7.9. They have Chemical, Physical, Metallurgical and Electrical testing Laboratories at Kurla. Laboratory tests are also undertaken on behalf of their suppliers. Some rigs have been installed to test some of the major assemblies like the engine, the transmission and the differential. They have a research and development department to look into the causes of defects and for development of improved designs. They claim that they have adequate test facilities. At present they do not employ any foreign technician but they have a number of Indian technicians trained abroad.

7.10. The Car maker claims that the oil consumption should be negligible upto the first 50,000/60,000 Km, and later it should be half a litre for every 3,000 to 3,500 Km; and the fuel consumption on an average should be 11.5 Km. per litre (or 32.7 MPG). The first change of tyres is recommended by them when the vehicle has done a distance of 40,000 to 50,000 Km. The battery is expected to last one and a half years on an average. The usual tools and accessories are supplied alongwith the car in addition to a service folder and an instruction book.

7.11. The details of the warranty for the car and the dealers are given elsewhere in the Report.

7.12. In pursuance of the directive given by the Government to avoid the use of stainless steel fittings, they have substituted stainless steel with aluminium in respect of the following—

(a) Outside door mounting.
(b) Radiator Grills.
(c) Garnish Mouldings.
(d) Roof drip channel.
(e) Division bar moulding.
(f) Rear Seat Cushion Front Frame Moulding.

Certain fittings and accessories have been eliminated in the present production which were fitted when the Fiat Delight was first introduced into the market. These are—

(a) the two elbow rests on the front doors,
(b) the rubber air-duct leading into the inside of the car and its control,
(c) manual throttle control,
(d) rubber moulding on the rear and front curved glasses,
(e) the finishers on the rear seating, and
(f) a single light instead of two, both inside the engine hood and inside the luggage boot.

A change has also been made in the design of the supporting rack mechanism in the luggage boot which is leading to certain complaints.

These deletions and changes have been made without any reduction in the cost of the cars, adding to customer dissatisfaction.

7.13. To the question whether the removal of the price and distribution control would improve the quality of their cars, the reply was that these extraneous issues would not alter the situation. It was, however, remarked that any price control on the car is anamolous so long as there is no price control on the products of the ancillary industry.

CHAPTER 8

THE FIAT CAR: ANALYSIS OF COMPLAINTS

8.1. The Committee will now deal with the complaints against this car. The car maker stated that there is no deterioration in the quality of the cars with regard to major functional assemblies, such as engine, clutch, transmission, steering, propeller shaft, rear axle, brakes, suspension, and radiators which are mostly produced and built in their plant. However, they have received some occasional complaints about them. The remaining complaints mostly pertain to bought out items. It was also explained that because of the uncertainties regarding the availability of foreign exchange during the last two years, they had to expedite the programme of indigenisation. Since the period has been small for the new suppliers to get over the teething troubles, the quality of the cars has suffered. Such difficulties according to them are the usual developmental troubles. It was reported that many of the defects that arose are under investigation and remedial measures are continuously being taken. They hope that in about six months many of the defects will be eliminated. The firm gave a list of 47 items (Appendix H) wherein the elimination of defects was being actively pursued.

8.2. It will, however, be seen from the Table at Appendix D that there has been an alround lowering of quality during the last two years, although the increase in complaints is more serious in respect of body, engine, suspension, steering and electricals.

8.3. *Body*—Most of the body defects relate to door rattle, ingress of dust, engine hood rattle, hard door closing, and early rusting of body panels. These troubles are largely arising out of inadequate control during body assembly operations. The door hinges are weak and sag under weight. The door rattle and ingress of dust is largely contributed by the elimination of the weather cord on the doors. However, the weather cord on the body frame is not of correct type because sponge rubber is not available and they had to adopt an afternative which is not satisfactory.

8.3.1. The complaint of early rusting of body panels is clearly due to little attention being paid to rusting of sheets while in stock and ineffective pacification of panel surface before painting. Unless greater care is given to this important detail, substantial improvements in paint quality will not be achieved.

8.3.2. The engine hood being relatively flat is inherently weak and easily prone to distortions as the internal ribbing is not quite effective. A redesign of the engine hood is necessary before this trouble can be eliminated.

8.3.3. Due to air getting in between the top sheet metal and the roof upholstery, pressure is created and roof upholstery falls down.

8.3.4. The company has recently carried out certain improvements. The original metallic door catch has been replaced by a nylon piece with a view to reducing door rattle. The window regulator cable which previously used to give trouble due to the ends being inadequately fastened has now been improved. The setting of the gap between the outer and the inner panels of the door for the movement of the window glass should be better controlled. The door panel should also be properly aligned with reference to the body.

8.4. *Engine*—The defects with the engine are oil leakage, premature wear of engine flywheel ring gear, timing chain noise and cracking of rubber hoses.

8.4.1. While oil leakage has been attributed, to a large extent, to defective gaskets and defective oil seals, greater attention to dimensional and surface finish accuracies during engine component manufacture is called for.

8.4.2. Noise in the timing chain is developing due to inadequate facility for adjustment of chain length. The car maker is intending to introduce a damper ring mechanism to minimize the noise. In addition to this, a rigid system for control of chain length prior to assembly should be enforced.

8.4.3. The flywheel ring gear is supplied by M/s India Pistons-REPCO. Action has been initiated by the car maker and the supplier to introduce more rigid control of dimensional accuracy in order to obviate such wear.

8.4.4. As far as the rubber hoses are concerned, they are supplied by various ancillary producers and the quality requires to be controlled at the supplier's end.

8.4.5. The machining of the engine block and head is mostly done on general purpose machines. As such, the accuracy depends to a great extent on the existing jigs and fixtures and the operator's skill. Stricter inspection is necessary if quality is to be consistently maintained. It was observed that certain 'No Go' gauges were going through.

8.4.6. Defects are also reported regarding improper functioning of water pump due to failure of its bearing. While the self lubricating spindle for the water pump is imported, the water pump seal is obtained from local suppliers. When the seal is excessively stiff, it leads to such trouble.

8.5. *Steering*—Although the steering gear design on this car is good, there have been cases of wear of the relay level pin/bush, premature wear of tie-rods and cracks developing on the steering wheel surface. Lately, there have been cases of the steering box cover plate falling off due to working loose of the holding down set screws. There has also been a general complaint of the warping of the plastic cover the steering column, due to the material composition not being resistant to prevailing temperature conditions. Steering box gets out of adjustment frequently with the sector shaft developing play in its roller bearing.

8.6. *Suspension*—To a large extent trouble being experienced on the suspension relates to weak rear springs, improper wheel alignment, incorrect wheel balancing, premature failure of wheel bearings and defective oil seals. The spring assembly has got only 4 leaves now and it is prone to sagging. The metal portion in the spring bushing rotates inside the rubber.

8.7. *Rear Axle*—There have been cases of broken rear axle, which is a very serious matter. Although 100 percent checking on surface hardness and tooth contact on ring gears and pinion gears is being carried out, greater control during forging of axles is necessary. There is also leakage of oil through seals.

8.8. *Electricals*—As in the case of the other cars, there has been a substantial increase in complaints relating to electrical fittings which include defective flasher units, inoperative starter motors' due to mis-alignment and/or internal short circuiting, poor quality of switches, premature failure of horns, defective windscreen wipers and pitted distributor points.

8.8.1. While these defects are essentially due to non-adherence to quality standards by the ancillary manufacturers, the car manufacturers themselves have done little to tighten up inspection at the time of acceptance of goods. More extensive and intensive checking of such components at the time of acceptance would un-doubtedly filter off a large proportion of defective supplies.

8.9. *Miscellaneous*—A variety of defects have manifested themselves in the recent past.

(a) *Painting*—Mention has already been made about improving surface preparation for painting. The paint shop should have efficient dust removal facilities. The synthetic enamel finish now in use creates problems as it does not lend itself to touching up in cases of peeling off, discolouration or eruption.

(b) *Door locks, door window regulators*—Inconsistent raw materials, inadequate facilities for heat treatment of rapid wearing parts and use of gravity diecast components, instead of pressure diecastings, are contributing to the sub-standard quality of these parts. Attention is also not being paid to correct alignment of channels which, at times, affect operation of the regulators.

(c) There have been many complaints about fuel gauges, speedometers and temperature gauges. The plastic float of the petrol tank gauge sub-assembly gets punctured frequently. Under the existing system the entire assembly has to be changed rather than the float alone.

(d) *Rubber parts*—There has been a general deterioration in the quality of rubber parts. Weather strips, suspension and engine gearbox mountings are causing trouble.

(e) *Oil Seals*—There are numerous complaints against the defective oil seals.

(f) An investigation should be carried out to ascertain whether the raw materials for the rubber products received by the manufacturers are of consistent quality. Particularly, for all the weather cords required for wind shields, it should be ensured that dimensions are consistent throughout and that they retain their shape.

(g) Windshield glass and the rear body glass do not have metal beadings on the rubber weather strip. Besides being decorative, this metal beading helped to keep the rubber in place and tight against the body and the glass and prevented seepage of water. The metal beading should be re-introduced.

(h) Trunk door stay rod rollers invariably become soft and the door does not stand up when opened. Though this is a small item by itself, this modification has badly affected the trunk door stay mechanism—one cannot be confident about the door remaining open while removing the stepney, tools or other things from the trunk compartment.

(j) Lack of attention to minor details, such as easy retraction of brake cable, defective lubrication in speedometer cable, loosely fitted window channels, incorrect alignment of grills, bolts and nuts not being tightened, wheel rims and brake drums not being true, etc., are examples of shoddy workmanship.

8.10. As far as imported steel is concerned, the firm receives test certificates for each batch from the suppliers. In case of doubt laboratory check is also made. Semifinished products and other indigenous supplies are accepted on the basis of inspection procedures laid down for dimensional and functional requirements. Regular check-lists for all the items have been issued but require to be followed strictly. The inspection system also should incorporate definite batch sampling method which is now non-existent. The inspection, at present, is carried out according to the discretion of the Inspector concerned.

8.11. A few functional test rigs have been installed. A larger percentage inspection of incoming components on these test rigs would reduce the extent of defects from incoming stores. Use of these test rigs should be extended to smaller ancillary producers situated around Bombay.

8.12. Stage inspection facilities in the Engine Block and Cylinder Head Manufacturing Section consist mainly of snap and plug gauges and a few pneumatic gauges. Although detailed technical procedures for their inspection have been laid down, they are not being rigidly enforced. This is all the more necessary due to the fact that these are manufactured mainly with general purpose machines.

8.12.1. Stage Inspection procedures for forge and machine shops, body assembly and trim lines have been laid down. However, these can be considerably improved and above all need to be rigidly enforced. Adequate arrangements for proper guaging facility in forge shops, better control on door assembly dimensions, surface preparation prior to painting need urgent attention. Instead of the current practice of carrying out laboratory tests only on incoming materials, stricter checking of quality on the production line will lead to better results.

8.13. Although gear mating and percentage inspection of important controlling dimensions in gear manufacture are being carried out, differential hum has not been eliminated. Attempts are being made to reduce this defect still further, and it is understood that the collaborators have also been contacted regarding this difficulty.

8.14. The Inspection Department is under the Controller of Technical Services. Instead it should be directly under the General Manager.

8.15. Engineering procedures for road test of vehicles after complete assembly should be laid down in greater details, indicating the manner and yardsticks for functional checking of each major sub-assembly. These check reports and deviations observed, if any, should be brought to the notice of higher management for initiating managerial action for improvement of quality.

8.16. There is no organized procedure of reporting of performance and analysis thereof. The Company has not taken any action so far to introduce modern techniques of quality analysis as an aid to management. Statistical Quality Control is now a well recognised procedure, and it is vital that a systematic review of the data collection, correlation, analysis and action procedures be made. Use of Frequency Charts would help management to determine periodicity of quality variation occurrences.

8.17. The Committee would like to mention that the present layout of the plant which is a result of piecemeal expansion is not conductive to efficient production. Revision of the layout would assist in yielding better results.

8.18. The Committee is constrained to remark that even if allowances are made for the quality of raw materials and bought out components, as compared to the imported ones that were in use till a few years ago, control has slackened considerably in the purchase of supplies and in the assembling and finishing processes, which are responsible for the present deterioration in the quality of this car.

CHAPTER 9

THE STANDARD HERALD: GENERAL

9.1. M/s Standard Motor Products of India Ltd., Madras, were incorporated in 1948 and started producing Standard Herald Cars in 1954 in collaboration with Standard Triumph International Ltd., UK. Earlier, they had commenced manufacture of the Standard Vanguard Cars in 1951 in collaboration with the same UK Company but latter discontinued its manufacture. In 1956 they took up manufacture of Standard 20 one-ton commercial vehicles using the basic Standard Vanguard Engine. In the category of cars the company is now producing only the Standard Herald Mark II.

9.1.1. The first models of cars produced were the Standard 8 in 1954 superseded by the Standard 10 in 1956. The production of the Standard Herald was started in the year 1960. Their collaboration agreement with Standard Triumph International Ltd., UK. stands extended upto November, 1970.

9.2. They have a Chief Engineer in charge of the factory. Under him he has a superintendent in-charge of production and another one in charge of the Press Shop. Two other senior officers are the Controller of Supplies and the Factory Manager. Under them are the usual run of staff manning the Machine Shops, Press Shops, the Assembly Division, the Tool Room, the Inspection Departments etc. They have one foreign technician with them at present. His services are being utilized for the work relating to the development of the four door saloon.

9.3. They have, in operation, apprentice, supervisory and inspection staff training schemes.

9.4. The level of production of cars achieved since 1963 has been as under:—

Year	*Number of cars produced*
1963	3,340
1964	4,008
1965	3,559
1966	1,098
1967	2,365 (Upto 31 October).

9.5. Plant facilities have been established for the manufacture of body, engine, gear box, transmission and suspension, thereby covering all the major sub-assemblies.

9.5.1. They purchase raw materials from various suppliers and buy all the forgings and castings from outside.

9.6. Apart from the manufacture of major components and sub-assemblies, they also buy many components from the ancillary industry and import a few items. Some of the major items which they buy from the ancillary producers are the pistons, clutch, propeller shaft, brake, all the electrical items, instruments, wheels, tyres, tubes and batteries. What they themselves manufacture, what they purchase from the ancillary industry and what they import are given in Table 5 in terms of value. It will be seen that they are still importing over 20 per cent components by value.

TABLE 5

Percentage value of components made in India and imported

Serial No.	Components	1962-63	1963-64	1964-65	1965-66	1966-67
		Per cent	Per cent	Per cent	Per cent	Per cent
(*i*)	Made in the factory	..	36·21	36·62	42·85	49·57
(*ii*)	Purchased from ancillary producers	..	20·77	23·01	29·31	30·08
(*iii*)	Total indigenous content	..	56·98	59·63	72·16	79·65
(*iv*)	Imported	..	43·02	40·37	27·84	20·35

9.7. They are basically following their collaborator's standards. In the case of raw materials, other equivalent standards are also used for procurement from different sources. The incoming raw materials and bought-out components are given visual and dimensional checks. Laboratory checks are conducted in case of doubt. The incoming raw materials, as far as imported items are concerned, are accepted on the basis of the test certificates. For indigenously bought-out items they depend largely on their suppliers' credentials, and on test certificates. Investigations are carried out on the field complaints received by the Chief Inspector.

9.8. They have an independent Inspection Department headed by an Inspection Engineer who is directly responsible to the Chief Engineer. In this department they have three sections viz (a) Inspection—Assembly Division, (b) Inspection—Manufacturing Division, and (c) Quality Control Section. The Assembly and Manufacturing Divisions are concerned with the task of carrying out inspection of components, panels, sub-assemblies, and final assembly of the vehicle. The Quality Control Section is entrusted with the task of upholding and improving quality standards in the organization. It is responsible for carrying out incoming inspections, stage inspections during various manufacturing processes, defect investigations and final testing during sub-assembly and assembly. They indicated the need for additional equipment in the Quality Control Section as given in Appendix I.

9.9. They have a chemical laboratory and inspection and testing equipments like rubber hardness testers, spring testers, and crack detection equipment. They are contemplating to have a metallurgical laboratory. They also do macro and microscopic examinations. They make use of other institutions such as the Indian Institute of Technology and the Madras Institute of Technology and depend upon their collaborators for getting the components periodically tested. At present the final testing of cars is done after a short drive on the road of about 6.4 Kms (4 miles). They are building a test track for testing of complete vehicles.

9.10. The car maker claims that the oil consumption should be 1 litre per 1000 Kms and the fuel consumption should be one litre per 10 to 12 Kms per litre. The first change of tyres is recommended by them when the vehicle has done a distance of 18.000 Kms. The battery is expected to last till the vehicle covers a distance of 32,000 Kms. The usual tools and accessories are supplied along with the car in addition to a service card and instruction book.

9.11. The details of the warranty for the car and the dealers are given elsewhere in the Report.

9.12. It was reported that having had no stainless steel beadings or parts, the directive for substituting stainless steel by other metals did not affect their car.

9.13. It was indicated by the company that price decontrol would assist in the improvement of the quality of the cars produced. It would also enable them to strengthen their organization, specially in the fields of inspection and quality control.

9.14. In the next Chapter the extent and nature of complaints covering the Standard Herald cars have been dealt with in some detail, and comments have also been made on the production techniques and quality control methods in vogue.

CHAPTER 10

THE STANDARD HERALD CAR: ANALYSIS OF COMPLAINTS

10.1. The Committee discussed with the Chairman and [illegible] the deterioration in the quality of the Standard Herald. [illegible] cated the defective items which were responsible for common complaints. According to them the only remedy was that till [illegible] manufacturers were in a position to supply reasonably standard [illegible] materials or components, there must be liberalization of [illegible] such items. In spite of constantly bringing to the notice of the suppliers the defects in their supplies, substandard materials and components were still being received. This resulted in hampering production. The problem of paint was specially referred to and [illegible] mentioned that the white paint peeled off rapidly, and they had stopped using it. A whole host of poor quality rubber components [illegible] plastics and electrical switches were shown to the Committee. [illegible] items referred to were wind screen and back view curved [illegible] and leaf springs. A large percentage of the leaf springs [illegible] them had to be re-worked. It was understood that the ISI had [illegible] withdrawn their license for use of ISI Mark issued to one of the suppliers on the basis of the complaints made by the Standard Motors. They gave a list of bought-out items which have contributed to the defects in their cars (see Appendix J).

10.2. The Table at Appendix E gives a summary of the [illegible] of defects relating to this car. The Committee is not satisfied that it has been able to collect complete data in respect of this vehicle due, unfortunately, to the paucity of factual information [illegible] by the car maker and their dealers. The response from the [illegible] was also limited and covered only a small percentage of the [illegible] use. In this case, therefore, the Committee has used the [illegible] data more to judge the trends rather than to make a [illegible] assessment.

10.3. *Body*—The complaints are generally confined to [illegible] out of alignment, door hinges being stiff, water leakage [illegible] ingress of dust, and early rusting of panels.

10.4. *Engine*—Much of the trouble reported against [illegible] of this car is attributable to excessive oil consumption [illegible] engine knock, engine oil leakage, broken radiator hoses [illegible] tive clutch.

10.4.1. The machining of the cylinder block and head [illegible] general purpose machines which call for much more [illegible] tensive dimensional control to produce quality products. [illegible] been serious complaint of defective oil pumps due to breakage [illegible] spindles. Proper control of grain flow during the forging [illegible] is necessary to minimize this trouble. Greater care [illegible] exercised with regard to selective assembly when building [illegible] engine, to reduce excessive oil consumption which develops [illegible] short period.

10.4.2. There has been serious complaint of defective [illegible] hoses which calls for stricter inspection at the time of [illegible] supplies from the ancillary suppliers.

10.5. *Clutch*—There are complaints of clutch shudder. This trouble can be attributed to variety of reasons, including improper spring compression, incorrect alignment of clutch pressure plate, etc. This is a case where trouble can be eliminated by a joint investigation by the car and clutch makers.

10.6. *Gear Box*—Trouble with the gear box is being caused due to oil leakage through defective oil seals, improper synchromeshing of gears due to inadequate attention to details at time of assembly, rattling of the gear lever, fouling of the gear boxes and hard engaging of gears. Greater attention to gear surface finish, lapping of important gear trains and more rigid inspection of the complete assembly is necessary without which the troubles would continue to persist.

10.7. *Transmission*—Trouble has been reported about noisy rear axles, improperly balanced propeller shafts, and oil leakage from differential housings. Cases were shown to the Committee where balanced weights on shafts had fallen off. Greater care is called for in the works of the shafts manufacturers to ensure that the shaft surfaces are properly cleaned when welding is done.

10.8. *Suspension*—While there are relatively few recorded complaints of defective suspension, excessive and rapid tyre wear is a feature of this car. This trouble will naturally continue until the design is suitably modified.

10.9. *Electricals*—In common with the other two makes of cars there has been a serious deterioration in the quality of the electrical fitments. The trouble will continue to persist till such time as the ancillary manufacturers improve their quality standards and the car makers institute more rigid and extensive inspection, with greater use of functional inspection rigs, at the time of acceptance of supplies.

10.10. *Miscellaneous*—Here again, the troubles on miscellaneous items such as poor quality of paint, defective door locks, inoperative door and window regulators, etc, are being caused due to the same reasons as indicated in the case of the other two cars. Similar action is necessary to minimize such complaints. It is unfortunate that lack of attention to minor details which hardly cost any extra effort or money is leading to so much consumer dissatisfaction.

10.11. The incoming raw materials, as far as imported items are concerned, are accepted on the basis of test certificates but for indigenous raw materials, no such test certificates are being received. Most of the bought-out items are accepted on the basis of the reputation of the suppliers. Whatever inspection is carried out is dependent on the experience of the Inspector concerned, who, at his discretion carries out visual and dimensional checks only. Laboratory checks are conducted only in case of doubts. Engineering procedure for inspection of various items, both raw materials and finished stores, require to be introduced along with better facilities for laboratory tests. There are very few functional test rigs; this facility should be augmented.

10.12. Although the firm exhibited various sub-standard ancillary supplies which are usually received by them, it appeared that little positive action has been taken by them to counter-act the [illegible] sub-standard quality. Only the tightening up of inspection [illegible] adherence to the standards can improve the situation.

10.13. The inspection system for various stage inspection [illegible] manufacturing processes is not satisfactory and requires [illegible] strengthened considerably. There is no provision for check [illegible] test profile of various body members. Due to the smaller [illegible] production, proper press and trimming tools have not been [illegible]duced by the firm. In view of this, it is felt that at least [illegible] of pressed panels should be more rigid, for which master [illegible] fixtures should be used.

10.13.1. Particular attention should also be given to the [illegible] of chassis box frame sub-assembly. In this case, there is [illegible] fixture available, but it was observed that further improvement [illegible] the manufacturing technique of the chassis would help [illegible] easier assembly on the fixture.

10.13.2. The gear shop is equipped with one universal [illegible]ing apparatus. It is felt that inspection facility for gears [illegible] to be considerably augmented and the strength of personnel [illegible]creased. In order to ensure more frequent inspection on [illegible] dimensions of gears, engineering procedures regarding the inspection [illegible] of gears should be laid down. Inspection records should [illegible] properly maintained.

10.14. In general it was observed that technical documentation [illegible] system to ensure provision of yardsticks for inspection [illegible]ence, recording and feeding of information to higher management [illegible] regarding the quality, percentage rejections, etc.. leave much [illegible] desired and require to be organized properly. At present, the [illegible]gations regarding the complaints received from the field are [illegible] carried out by the Chief Inspector's department. Since inspection [illegible] techniques and procedures require to be further tightened, [illegible]gations regarding field defects may be carried out by some other [illegible] department so that the Chief Inspector is relieved of the [illegible]bility and is able to devote more attention to routine inspection [illegible] practices.

10.15. The surface preparation prior to painting, better [illegible] on trim line assembly and specific procedures for final testing [illegible] sub-assemblies and assemblies require to be developed. The diff[illegible]tial testing equipment should be placed in a sound-proof cabin with arrangements for applying load on the differential.

10.16. Engineering procedures for road test of vehicle [illegible] complete assembly should be laid down in a more detailed [illegible] indicating the manner and yardsticks for functional check [illegible] major sub-assembly. These check reports and the deviations [illegible]served, if any, should be brought to the notice of higher [illegible]ment so that, from the observed tendency, managerial action [illegible] improvement of quality may be initiated. It is desirable [illegible] a roller test bed is also installed.

10.17. It is essential for any car maker to have his [illegible]h and development section, for well-known reasons. The [illegible]y should also establish its own department like the other [illegible]r makers.

10.18. There is no organized procedure of reporting of performance and analysis thereof. The company does not appear to have taken any action so far to introduce modern techniques of quality analysis as an aid to management. Statistical Quality Control is now a well recognized procedure and it is vital that a systematic review of the data collection, correlation, analysis and action procedures is made. Use of Frequency Charts would help management to determine periodicity of quality variation occurrences.

CHAPTER II

THE ANCILLARY INDUSTRY

11.1. No other big industry is capable of stimulating the growth of the supporting or ancillary industries to the same extent as the automobile industry. This is because a motor car is made up of four to five hundred major parts, and from the point of view of economic advantage, no car maker can afford to make all the components under one roof. The practice all over the world is for car makers to manufacture as few components as becomes inescapable and buy the remaining from the ancillary producers. As has been said earlier, due to historical reasons, the car makers in the country started by making many of the vital parts themselves and imported almost all the rest. However, aided by favourable government policies since 1953, which aimed at rapid indigenization by giving protection to the industry and putting a curb on imports, the automobile ancillary industry has caught up remarkably well. It will be seen from the previous chapters on individual makes of cars that only about 2 to 3 per cent of parts are now imported for the Ambassador and the Fiat Cars and less than 20 per cent for the Standard Herald. There is also the big business in replacement parts which the ancillary industry caters for. There is willingness on the part of the large majority of the producers to improve and thus the future outlook for the industry is very bright indeed.

11.12. This industry is classified into two groups. The small-scale producers are those who invest a capital of Rs. 7.5 lakhs or less on the plant and machinery; the medium and large scale producers are those who make correspondingly bigger investments. They ordinarily require only promotional assistance but the small-scale manufacturers need, not only financial assistance but also other concessions and support before they can profitably establish themselves. Today, there are well over 300 units in the small-scale group, and over 200 in the bigger sectors. Though well dispersed in the country, there is a concentration in and around Madras, Calcutta, Bombay and Delhi. Excluding tyres, tubes, and batteries, the progress in production made during the years 1962 to 1966 by some important sections of the ancillary industry, registered with the Automobile and Ancillary Industries Association, is given below:

(Production in Millions of Rupees)

	1962	1963	1964	1965	1966
Engine parts	104	140	176	212	261
Electrical parts	10	22	40	54	63
Transmission and Steering parts ..	30	59	84	108	134
Suspension and braking parts ..	52	75	96	121	177
Equipment (such as dash board instruments, bulbs, etc)	12	21	31	32	42
Chassis, body and parts	12	13	19	25	34
Total ..	220	330	446	552	713

11.2.1. It is expected that in 1967 they may well exceed the 800 million mark. The production of the small-scale sector would be another Rs. 80 millions.

11.3. All the car makers have suggested that most of the defects in their cars are due to the sub-standard products which are being supplied by the ancillary manufacturers. Many of the car makers have further blamed the ancillary industry for inconsistent supplies and uncertain deliveries which upset their production plans considerably. An accusation was even made that rejected material is often sent back again. mixed with other fresh batches, in the hope that it may get through on the basis of sample tests. The analysis given by one of the car makers of the complaints received by him against his car supports his contention, to some extent, that complaints against the components made in the car maker's factory have been gradually going down and those against the ancillary products are going up. In a nutshell the car makers want quality, good deliveries, and competitive prices, which the ancillaries, by and large, are unable to give.

11.4. Some of the ancillary producers, on the other hand, made out a case against the car makers that they do not plan their requirements properly, with the result that orders placed on the ancillary producers are erratic, and sometimes, if there is any hold up in the car maker's plant, even firm orders have been cancelled at short notice. Another complaint made is that the ancillary suppliers are asked to cut down their prices without any rational basis. Some cases have also arisen when long established suppliers have been told that no further orders would be placed on them because cheaper supplies could be obtained from other sources. Often ancillary suppliers are asked to give long term financial accommodation to the car makers which they can hardly afford on account of their own slender resources. It was, therefore, emphasized on behalf of the ancillary producers that if the ancillary industry was to establish itself on a sound base, there should be a regular flow of orders on them and payments should be prompt for the supplies made It was emphasized that the car makers were free to inspect and test the supplies strictly and it was their own fault if they accepted substandard products. These mutual bickerings serve no useful purpose. The two wings of the automobile industry must realise that their rules are not antithetic but complementary and. therefore, they have to work in close cooperation. Customer satisfaction is the foundation for success in manufacturing and they must realize its significance.

11.5. The Committee visited some aucillary plants engaged in the production of a few specialized items. Some others were also visited which were manufacturing a large variety of smaller components. The Committee held discussions with many representatives of the ancillary producers. Special mention may be made of the progressive President of the All India Automobile and Ancillary Industries Association. These discussions were very fruitful as they gave to the committee an insight into the working of the ancillary industry, their problems. and their needs. Quite fruitful also was the discussion the Committee had with the representatives of the small-scale industries who were introduced to the Committee by the Development Commissioner. Small-Scale Industries. Some samples were produced of what was being made by the small-scale entrepreneurs.

It was accepted by all of them that, as in the case of the car makers, so also in the case of the ancillary industry, it is very necessary that there should be the greatest emphasis on supervision, inspection and quality control. In fact, in the case of an ancillary producer, who has to achieve high specialization in his limited field this emphasis is all the more necessary. In this respect, while some of the bigger units have a better account to give than even the car makers, many in the medium and small-scale industries seemed to be unappreciative of the inherent necessity for such virtues, even if they had the where-withals for observing them. In the opinion of the Committee many of the complaints against the cars arise because there is no proper supervision and testing of the materials and sub-components that are received by the ancillary producers in their works from their own suppliers.

11.6. It is necessary that the competition between the ancillary units should be fair and healthy. It appears that it is not possible at present to limit the number of ancillary producers by any governmental action either in the case of the bigger manufacturers or those in the small-scale sector if they do not need any assistance. It was also brought to the notice of the Committee that often the State Directors of Industries were keen to set up industrial units, belonging to the automobile ancillary group, in their States, irrespective of the fact that already some units had been established in other places. This naturally leads to an unhealthy competition between such producers, which finally ends up in the inevitable lowering of the quality of the products. Whereas the disadvantages of a single source of supply are quite patent, too many producers manufacturing the same items, without adequate demand, must also be frowned upon. Another important matter needing mention is that, as far as feasible, the spheres of activity of the large, medium, and small scale sectors may also be defined to minimize *inter se* competition amongst those groups.

11.7. Over 70 of the bigger ancillary units have been set up with foreign collaboration. In most cases the collaboration agreements are for a definite period. The collaborators in some cases also assist them in the sale of their products in foreign countries, more specially where the collaborator's own products are sold. This of course happens only if the quality of the products is of the required standard.

11.8. In the technical sphere, there is the inevitable disparity in the equipment that the various sectors possess. The bigger producers, especially those who have entered into foreign collaboration, have been able to afford well balanced and modern equipment and testing rigs eminently suited for mass production. They have also, by and large, their own testing facilities for rigid quality control. Those in the medium sector are not so fortunate but the small-scale units can ill afford their own testing equipment. It, therefore, becomes necessary to provide central facilities at reasonable rates to lend them a helping hand.

11.9. The production of each of these sectors can be further improved by properly conceived programmes of personnel training, and setting up of design and development sections for effecting increased operational efficiency. Not only can increased utilization be made of the existing facilities, by providing balancing equipment wherever needed, but duplication should be avoided and the spare capacity thus generated could possibly be used by other complementary units. Industrial engineering and operational research can be used for not only suggesting better designs and layouts for the factories but by indicating better basic processes and other improvements, the productivity of men and machines can be considerably increased. Proper design and development sections would assist in this sector as much as the bigger car making industry. They will also be greatly benefited if the interchangeability of components advocated for the three makes of cars materializes. This discussion will not be complete without mentioning that labour productivity can be increased only if working environments and adequate amenities, awards, and incentives are provided for the workers.

11.10. In the present state of our know-how, collaboration with foreign experts or firms, who are in the same field may often become essential for the development of some products. But in many cases the line of least resistance is adopted by continuing the collaboration for indefinite periods. This is a tendency which has to be curbed if a better and rational development is sought for by the Indian industrialists. The earlier an indigenous industry tries to stand on its own legs in the matter of know-how also, the better it is for its sound development. In this connection it will not be out of place to mention that the Tariff Commission had made the following recommendation in 1956—

> "(32) All firms with a manufacturing programme should become independent of their foreign associates within as short a period as possible. They should set up designing and research sections of their own and introduce schemes for the training of apprentices. (Paragraph 20(i)."

11.11. The biggest handicap in the way of the ancillary industries is the difficulty about raw materials. It is a pre-requisite for the rapid growth of the industry that there should be uninterrupted flow of raw materials, of the required standard and of consistent quality. For many types of raw materials the ancillary industry has still to depend on imports and it is only slowly that indigenous production of raw materials is building up. Special action is, therefore, necessary on the part of the Government to initiate measures which will improve and substantially step up the manufacture of specialized raw materials, irrespective of the quantities required by the automobile industry. The public sector steel plants should be made to realize their responsibility in this development, as major Break through will be possible only whom ferrous raw materials are indigenously available at reasonable prices. In this context it should also be stated that substitution of expensive non-ferrous metals, by ferrous or other substitutes, is another direction in which something is being done but much remains to be achieved.

11.12. The Committee in the course of its visits was pleasantly surprised that some plants engaged in the production of vital components such as pistons, piston rings, engine valves, brakes, thin walled bearings, starter motors, dynamos, spark plugs, propeller shafts, and shock absorbers have been established on sound lines. Although there have been a few complaints now and then about some of the items produced by them, the Committee is satisfied that the managements have taken adequate measures for eliminating them. However, it can be said that, by and large, the complaints against many of the ancillary manufacturers producing goods below the accepted standards are not without justification.

11.13. Some typical instances will now be given of the ancillary producers who are aware of their defects but still do not hesitate supplying such components to the car makers or the spare parts market. In the case of a complaint against the oil seal required for a particular location in a car, the ancillary producer had attributed it to the spring used in it, which was not of the correct type, and since proper equipment for manufacturing the spring was not available, it had to be produced by him with a make-shift arrangement Yet, the ancillary manufacturer knowing fully well that an oil seal, with such a spring, would not perform its function satisfactorily, did supply it to the car maker who also accepted it, as his assembly line was to be kept moving. In the case of complaints regarding premature fusing of his electric bulbs, the ancillary producer concerned reported that ingress of air and dust during manufacturing operations was mainly responsible for it, and if the complaint had to be eliminated, an automatic plant would be necessary, which is run under controlled atmospheric conditions. The capital involved in providing such a plant would not be justified on the off-take of this component. In the case of defective window and door regulators, although the producer also blamed the car maker for wrongly fitting his components. he did admit having used springs of his own manufacture because the price charged by the standard spring manufacturer was so high that it would not have been possible to meet its cost out of the price that he got from the car maker. On the question of leaky gaskets, the representative of the manufacturer disclaimed all responsibility for the defect in his product, pointing out that the trouble arose due to improper tightening of the bolts and the improper finish of the matching surfaces.

11.14. While examining several incoming materials in the car makers plants, the Committee observed that several of them were of poor quality. Weather strips, even from their look, were sub standard. Electrical wiring did not have the ends soldered properly. The chromium plating showed a poxy-surface. A large portion of the leaf springs supplied to the firm had to be dismantled and reworked by the car maker. It was understood that the ISI had now withdrawn their license for use of ISI Mark from one of the suppliers on the basis of the complaints made by the Standard Motors. The tack welded balancing weight on a certain make of propeller shaft was said to blow off in the first run. The clutch supplied was seen to have very poor springs. A whole host of rubber and plastic components and electrical switches did not appear fit for use. The barrel of the ignition switch of a car came off as the key was extracted. Instances of this nature could be multiplied.

11.15. The Indian Standards Institution can help, in a big way, by taking up the certification of car ancillary products and by issuing certification marks to the firms dealing in them, This will not only help the car makers and the dealers but also the vendors of spare parts, as well as the car owners, in purchasing the proper type of components.

11.16. The Development Commissioner, Small Scale Industries, drew attention to the measures the Government took in Japan in dealing with a similar situation there and, in particular, commended the law enacted on the prevention of postponement of payment to sub-contractors. The main points of the law are as follows:

(i) Parent enterprises should make the contracts with sub-contractors in written documents describing the terms of the sub-contractors' work, the amount and the date of payments, etc.

(ii) Parent enterprises are prohibited from doing the following:
- — rejecting without justification the acceptance of sub-contractors' work,
- — postponing payments to sub-contractors,
- — cutting down the amount of payments, etc.

(iii) The Fair Trade Board is authorized to recommend parent enterprises to execute the above mentioned obligations. And in case the recommendations are not respected, the Fair Trade Board is authorised to make the fact public.

(iv) The Fair Trade Board and the Director of Smaller Enterprise Agency are authorized to request parent enterprises and sub-contractors to make a report on their trade agreements and also to let officials of these agencies to enter their establishments to inspect the relevant documents if necessary.

11.16.1. He also sent the Committee a draft copy of the agreement entered into by public sector project with the contracting supplier and recommended that similar contracting procedures could be adopted in the automobile industry. However, proper purchase and payment policies must be evolved both by the car makers for their ancillary producers and by the latter with their sub-contractors.

11.17. It will assist the industry considerably if action is initiated for collecting information regarding complaints and failures of the parts supplied by them. Such feed back information would be immensely helpful in revising their standards for the defective components. A very useful step had been taken by the All India Automobile Ancillary Industries Association by setting up a study team under the Standard Quality Control Unit of the Indian Statistical Institute of Madras, for determining the life of auto components. From this study the Association would be able to assess the requirements of components during the coming years. It will be very useful if a comparative study is also made of the life of the components produced in the country, as against those that are produced abroad, so that a proper comparison may be made and steps taken to remove the deficiencies of the indigenous products. It will also be helpful if the Association could devise ways and means, to make the constituents observe the code of conduct evolved by it, under pain of being disaffiliated under public notification, if there is a breach of it by any producer.

11.18. The Committee would suggest that a National Award like the Deming Award in Japan be instituted in the country to promote quality consciousness in the automobile ancillary industry

11.19. In this chapter, the Committee has traced the develop-nt of the ancillary industry and tried to bring out its short-ings, its difficulties, and its needs and further what could be ne to achieve optimum production of quality goods. However, in mming up, it may also be put down as the considered view of e Committee, that the ancillary industry has contributed substan-ally to the causes that have lead to the deterioration in the quality cars. Whereas there are some units which are producing quality mponents, many others lack proper machinery, the wherewithal nd above all, the proper skill and quality consciousness, to be able produce goods of acceptable quality. There is also the handicap the shortage of a number of raw materials of consistant quality all the three categories of ferrous, non-ferrous, and non-metallic terials. Apart from establishing testing facilities for them on a operative basis, the car makers can assist in improving the situa-n in a big way if they plan their orders in advance and, while cepting the goods, impose strict inspection and tests but make mpt payment for the accepted articles. It is only when the car kers and the ancillary producers work in full cooperation and laboration that this sector can prosper and deliver the goods.

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CHAPTER 12

RAW MATERIALS

12.1. A motor car is a complex product consisting of several thousand components made of different materials, each of which has to perform its specific function. The components have to be manufactured from proper raw materials and should conform to certain minimum requirements with regard to strength, dimensions and performance.

12.2. These raw materials could be broadly classified as falling under ferrous, non-ferrous and non-metallic groups. Ferrous materials consist of carbon, alloy and tool steels in different forms such as sheets, strips, flats, rods, tubes, wires, forgings, and castings. Non-ferrous materials include brass. copper, lead, tin, zinc, antimony, and their alloys, chromium, cadmium, silver, nickel, etc., in different forms. Non-metallic materials include textiles rubber plastics, glass, paints, adhesives, chemicals etc.

12.3. It would be pertinent to mention at this stage that the automobile industry has taken certain steps to rationalize their requirements of carbon, alloy and tool steels with a view to assisting their economic production in the country. This is a step in the right direction.

12.4. Although, certain forms of carbon steels, namely, flats, rods, tubes and wires of the required quality are available in the country, cold rolled steel sheets of the deep drawing quality, required for the body panels of the cars, are not yet available indigenously. The only steel plant that can manufacture these is the Rourkela Steel Plant, but they have not as yet developed the required facilities to manufacture, consistently the quality of sheets required by the automobile industry. It was brought to the notice of the Committee that certain experimental tonnages of sheets were given to the car makers but these have not been found to be of the required quality for use in certain body pressings. However, to avoid imports as far as possible, these sheets have been accepted for a few body parts.

12.5. Most of the alloy and tool steels have still to be imported. It is, however, expected that with the production of alloy steels in the Alloy Steels Project, Durgapur, and other units in the country, requirements of the automobile industry would be met in the near future. The Government should, however, impress upon the Rourkela Steel Plant to expedite production of cold rolled steel sheets, of deep drawing quality, for use in the automobiles.

12.6. One of the main considerations for establishing the basic public sector enterprises was to provide the necessary support to the consumer and other industries for ensuring, amongst other things, a speedy industrial growth of the country. The Hindustan Steel Ltd., together with the Durgapur Alloy Steel Plant, must, therefore, play a vital role in providing, irrespective of the quantities required, the main ferrous raw materials of the quality needed to the car makers and the ancillary producers, which are at present, perforce, to be imported. The cost of the imported steel of various types which could be manufactured in the country amounts on an average to Rs. 1,500 per car and forms 60 to 70 per cent of the total imports needed. With a little more determination on the part of the concerned public sector plants to help, this big drain on the foreign exchange of the country could easily be eliminated.

12.7. Practically all the castings required by the automobile industry are available in the country. Similarly, cerbon steel forgings are also available in sufficient quantities and in the qualities required by the automobile industry. In the field of non-ferrous materials, except aluminium, most of the others have to be imported.

12.8. In the field of non-metallic materials, although most of the materials are available in the country, there is considerable difficulty in getting the right type of raw materials fulfilling the specifications. Particular mention should be made of paints, rubber and plate glass. As has been stated elsewhere, the quality of paints supplied to the manufacturers is not consistent in quality. The Committee is of the opinion that there is sufficient paint technology available in the country and with such help it should not be difficult for the paint industry to cater to the needs of the automobile industry.

12.9. With regard to rubber components, synthetic substitutes are coming into vogue in foreign countries in a large measure but, unfortunately, the development of such substitutes in this country is still in its infancy. Most of the rubber components are manufactured from natural rubber, which is responsible for a wide variation in the consistency of this raw material. There is also need for the required research and developmental work to be done in this field, with a view to developing suitable rubber components, to withstand severe atmospheric conditions obtaining in the country.

12.10. Many complaints have been received with regard to windscreen glass. As plate glass is not manufactured indigenously, windscreen glass has to be made of sheet glass. According to the manufacturers this has led to serious defects in this component. It is important that the manufacture of plate glass should be expedited and till then strict inspection and control methods should be adopted in the manufacture and acceptance of windscreen glass. This is a vital component in the car and a bad glass is a safety hazard.

12.11. The Committee also noted that even in the selection and purchase of raw materials proper standards, either for the quality of the raw materials or for methods of tests, are not being followed by the car makers. This is one of the primary causes for a large number of complaints that have cropped up in the recent past. It is important that car makers and the ancillary producers should agree on the quality of raw materials and inspection methods, and they should also equip themselves for testing the incoming raw materials required for the manufacture of components.

12.12. One of the drawbacks in securing consistency in the quality of imported raw materials may now be mentioned. This difficulty usually arises from the delay that usually takes place in the release of foreign exchange and which is also not given for the same country of origin as is given for the previous batches of the same raw material. With different specifications and qualities uniformity cannot be maintained.

12.13. The Committee would like to call for a closer cooperation, between the car makers and their ancillary producers, about their testing facilities being made use of by one another, aimed at the improvement in quality of raw materials.

12.14. National standards should be evolved for all raw materials used in the making of a car after assigning a suitable order of priority.

CHAPTER 13

QUALITY CONTROL

13.1. The quality of any product connotes its composite characteristics that determine the degree to which the product satisfies the requirements and expectations of the consumer, for the purpose for which it is used. The characteristics may be appearance, dimensions, workmanship, finish, strength, performance and durability.

13.1.1. It would also be worthwhile to mention here the difference between quality and reliability. Obviously, quality without reliability is of limited usefulness, and a reliable product has to be of good quality. However, if a hair splitting distinction is made, it can be said that if a product does not conform to all the requirements of the specification for the product, then a 'quality problem' exists. But if a product fails to perform its intended function for an adequate period of time, even though it may be satisfactory to start with, then a 'reliability problem' exists. Quality is essentially concerned with the functioning or performance of a product for a reasonable length of time.

13.2. Speaking of the quality of cars, the following aspects are generally considered:

(a) The look of the car, both inside and outside, from the point of view of aesthetics and its functional reliability for trouble-free performance over a period of time,

(b) Safety, and

(c) Initial, running and maintenance costs.

13.3. The required quality of cars is achieved by

(a) using raw materials and components conforming to prescribed standards,

(b) Observing statistical quality control methods for selection of raw materials, production and assembly of components, and

(c) The application of proper inspection and test methods during production, assembly and finishing.

13.4. Inspection has often been regarded by the industry to be the sole means for assuring quality, but inspection alone cannot build quality into a product. It is at best a post-mortem examination and only sorts out the defective products from the good ones. As far as quality is concerned, it has to be squarely built into the product and it cannot be inspected into it. For ensuring high degree of quality, productivity, and reduction in cost, it is essential that quality control should permeate all the phases of production, right from the designing of the product and purchase of raw materials, through manufacture to finished products and even further beyond to the analysis of consumer complaints.

13.5. From this point of view, the Committee made a special study of the quality control and inspection practices followed by all the three car makers and some of the ancillary producers. M/s Hindustan Motors and M/s Premier Automobiles have evolved reasonably good quality control and inspection systems but these are not being made use of effectively. M/s Standard Motors Products neither have quality control and inspection procedures comparable to the other two nor are these being implemented effectively in practice. Some of the ancillary industries have quite a commendable system of quality control and inspection practices in operation, but the vast majority, especially the smaller units, lack even the minimum facilities and staff for enforcing them.

13.6. The Committee would like to mention that Japan has made phenomenal progress in the automobile industry since it introduced the statistical quality control methods very effectively, both at the level of main manufacturers of cars as well as in the ancillary industries. The Committee is confident that if quality control consciousness is imbibed into our automobile industry, great strides could be made in this field. It is understood that the Automobile Ancillary Association of India has instituted an award for best quality control methods adopted in any one of their units.

13.7. Quality control has developed into a science by itself. The latest techniques, if adopted, lead not only to improvement and maintenance of quality but also to reduction in costs. The Committee recommends that every unit in the car industry should seek the assistance of any one of the organizations in the country imparting training in statistical quality control, to organize the quality control methods for their adoption.

13.8. The quality of the raw materials and bought-out parts from the ancillary industry should be controlled by adopting suitable statistical sampling plans. It would be necessary to have different scales of sampling, including 100 percent inspection in the case of certain type of materials and parts, depending upon their importance, cost, and the nature of the characteristics to be checked. For example, brake components, tie-rods, axel shafts, which, if unsatisfactory, could be of great danger to the public, have to be sampled, inspected and tested to a larger extent than certain other non-critical parts. Indian Standards on sampling inspection could form a useful guide in this connection.

13.9. Quality Control during production or process control should be extensively followed with a view to maintaining and improving quality and enhancing productivity. For this purpose statistical control charts would be immensely useful. Depending upon the nature and the importance of characteristics to be controlled, the control charts may be either for the variables, attributes, or count of defects.

13.10. After manufacture of the components, it is necessary to ascertain their conformity to the relevant specification requirements on the basis of statistical sampling plans, including 100 present inspection, depending upon the nature, importance, and cost of the characteristics to be checked. Here again, the Indian Standards on sampling inspection would be very useful.

13.11. There should be a thorough final inspection and functional testing of the finished cars on 100 per cent basis. Also, the life and performance of the vital components of a few cars should be determined under the actual road and climatic conditions, with a view to drawing inference about the reliability of all the cars belonging to the corresponding batch of cars manufactured.

13.12. Although the product may conform to all the requirements of the specification, ultimately its reliability depends upon its performance, which can only be judged by evaluating the performance requirements of not only the components but also the car as a whole. In overseas countries for this purpose, occasionally the cars are taken in rallies, race tracks, etc. and the car makers themselves run a certain number of completed cars over test tracks specially built for the purpose.

13.13. In order to instill a measure of confidence and give assurance to the car user, the car makers provide a warranty offering free replacement of defective parts, within a specified period of time and distance traversed, which at present varies amongst the car makers.

13.14. A system of continuous survey regarding the quality in the market and at various service points with a view to feeding back the information to the design and quality control departments, should be established. For analysing these reports periodical meetings of the design, production, and quality control departments would need to be held.

13.14.1. The information on claims for compensation and reports of complaints from dealers and service points should be analyzed and corrective measures taken.

13.15. The Committee would like to stress that it is from the management that inspiration about quality is derived by all the personnel of any manufacturing unit. The Committee would recommend that every managerial personnel should undergo periodically a course of management training which is conducted by various well established institutions in the country. The management thinking and objectives with regard to quality and its control should be clearly expressed and communicated, throughout the factory, by means of written policy statements and other directives. There should be a full-fledged separate quality control department manned by well qualified personnel, in each of the manufacturing units directly under the top managements, to guide and co-ordinate the various quality control activities. Training programmes may be organized within each manufacturing unit for the middle management and the workers, with a view to generating quality consciousness in them. Periodicals, pamphlets, case histories, describing specific application of quality control, and display of posters may also be used for promoting better quality consciousness.

13.15.1. The expenditure incurred by the three car makers on quality control, research and development as a percentage of the annual turnover for 1966 has been worked out as 1.13 for Hindustan Motors Ltd., 1.91 for M/s Premier Automobiles Ltd. and 0.34 for Standard Motors Ltd. Quality control methods at all the three car makers' plants, as well as at many of the ancillary units, should be greatly improved. Various measures have been suggested by the Committee in order to provide incentive to both the car makers and the ancillary producers. Some financial incentive should also in the opinion of the Committee, be provided to them. It is therefore suggested that a rebate be given on the tax collections from each of the units in proportion to their expenditure incurred on inspection and quality control.

13.16. The Indian Standards Institution has a well-developed scheme for assisting the industry to maintain proper quality control methods. This scheme which the Institution operates under the ISI (Certification Marks) Act, provides a third party guarantee for quality of a product.

13.16.1. The Committee discussed with the Director General of the Indian Standards Institution whether ISI could take up certification marking of all the critical components used in the manufacture of passenger cars. He explained that before the ISI Certification Marks could be given there had to be an Indian Standard for the component concerned. However, recently an amendment had been made to the ISI Certification Marks Act according to which, in case there is no Indian Standard, ISI could recognize an overseas standard or even a company standard as an Indian Standard with such modifications as might be necessary and then take up the certification marking of that product. In such a case, however, immediate steps would be taken by ISI to process the standard through its technical committees for publishing it as an Indian Standard. In this process, naturally, Indian raw materials and conditions would be taken into account for modifying the standard concerned. In a few cases this may also involve complete or substantial re-designing.

13.16.2. The Committee was also informed that the Certification Marks Scheme of ISI was operated on no-profit-no-loss basis and there was a maximum and minimum marking fee in each case depending upon the total output. On an average, the marking fee for the products ranges between 0.01 per cent to 0.1 per cent of the total turn-over.

13.16.3. The procedure adopted by ISI before issuing a licence to a manufacturer was also explained to the Committee. According to the scheme, before a licence is issued, ISI sends its Inspector to the manufacturer's factory to determine and make sure that the organization has the necessary equipment for production and testing the product from the raw material stage to the finished stage, and that the organization is capable of producing the goods to the requirements of the relevant Indian Standard. Furthermore, the manufacturer has to agree to follow a scheme for inspection and testing, which is drawn by ISI in consultation with the manufacturer, taking into account the principles of statistical quality control and sampling methods. There are adequate safeguards and penalties for ensuring that the products bearing ISI Mark conform to the relevant Indian Standard.

13.16.4. The Committee was also told that there were already eleven Indian Standards relating to the automobile industry for which ISI had granted licences to the manufacturers.

13.16.5. The Committee recommends that the Government should request the Indian Standards Institution to formulate Indian Standards for all the critical components that go into the manufacture of passenger cars and that these components should be brought under the ISI Certification Marks Scheme.

13.17. The Committee feels that the Government of India should institute a system of technical audit for production performance in order to see that the car makers follow proper manufacturing, quality control and inspection methods, with the result that the car which finally comes out conforms to certain minimum standards of quality. This would be a very important step in order to arrest the present trend of deterioration in quality, as also to quickly improve it by assisting the manufacturer in adhering to certain established procedures so that the car that is finally marketed gives trouble-free service for a reasonable period of time.

13.17.1. For this purpose, an adequate number of properly skilled Government Inspectors would have to be posted in the premises of all the car makers. The scheme may be extended to important ancillary industries on an individual or group basis as feasible. The details regarding the technical audit could be worked out by the Government of India.

13.17.2. The Committee would like to suggest that the scope of work of the Inspection staff should cover the following—

(a) To inspect the incoming raw materials and components accepted by the management of motor car makers,

(b) To take note of and to assist the management to lay down policies for the disposal of the materials rejected by it in order to prevent the rejections from being mixed with new supplies and from finding their way into the flourishing spare parts market,

(c) To observe that the quality control methods and procedures are being followed by car makers, without interfering in the day-to-day affairs of the plants or stopping the production or assembly lines,

(d) To direct implementation of any Government directives in regard to quality control and other practices and undertake such other functions that may be assigned to them from time to time by the Government, and

(e) To make reports to the Government regarding the shortcomings in these plants so that Government could take suitable action.

13.17.3. While the type of inspection to be conducted and the products to be inspected would be the choice of the inspection staff, it would not be responsible for the quality of motor cars or for the quality of the parts and materials supplied by the ancillary or the service industry, the responsibility for which must squarely rest on the car makers or the ancillary producers if and when the scheme is extended to the important ancillary industries, on an individual or group basis, as feasible.

CHAPTER 14

STANDARDIZATION, RESEARCH & TESTING

14.1. Standardization has a very important part to play in the improvement of quality, enhancement of productivty and reduction of costs. Standards define the quality of the materials, lay down methods for evaluation of the quality and prescribe sampling procedure for ascertaining conformance of a product to the specified quality. Standards are established by convention of law. The Committee is not aware of any recognised standard for a complete motor car. However, standards have been established for raw materials and components. Test procedures have also been laid down for determining performance.

14.2. Standardization practices in the automobile industry have been developed in overseas countries at three distinct levels as indicated below—

(a) National,

(b) Association, and

(c) Company.

By and large, standards at the national level cover the basic raw materials such as ferrous and non-ferrous metals, ferrous and non-ferrous castings, fasteners, certain electrical parts etc. At the association level, standards are developed for the components, procedures for performance tests of components, tests for assemblies, etc. At the company level, standards primarily consist of design standards from the point of view of fitment of components and assemblies, standards for raw materials, etc. By and large the company standard is based on both national and association standards wherever they exist. In countries like the USA and UK, there are powerful associations, such as the Society of Automotive Engineers and the Society of Motor Manufacturers and Traders, which look after the standardization activity in this field to a very large extent. Unfortunately, no such activity has yet been taken up by the organized automobile associations in this country. Under the present circumstances the work for evolving standards has perforce to be taken up, at the national level, by the Indian Standards Institution as they have the necessary wherewithal to expeditiously complete this task.

14.3. M/s. Hindustan Motors has till recently collaboration with M/s. Morris Motors belonging to the BMG Group in UK, the Standard Motors have collaboration with M/s. Standard Triumph International of UK and the Premiers with M/s. Fiat Torino of Italy. Each one of these car makers is adopting the design and standards followed by its collaborator. Little attempts has been made by the car makers to develop their own standards to suit available raw materials and local conditions. So long as there was no foreign exchange difficulty, this system worked fairly well, as they could import any raw materials or components from overseas. But, with the foreign exchange difficulty, the need for import substitution and development of standards within the country has been keenly felt.

14.4. The Committee scrutinized in some detail the standardization practices at present followed by the manufacturers of the passenger cars as, also some of the ancillary industries. The Committee had also detailed discussions with the Director General of the Indian Standards Institution in this respect.

14.5. After detailed discussions with the car makers and visits to some of the ancillary industries and discussions with some of them, the Committee feels that there is scope for variety reduction with regard to raw materials and components used by the car makers.

14.5.1. The Committee was glad to note that in the field of carbon, alloy and tool steels, the manufacturers have already attempted a variety reduction but the Committee is of the view that there is further scope for reduction in the number of steels used. Many of the ancillary producers explained to the Committee that with little change some common components could be standardized for use in all three cars. However, because of their collaboration arrangements and a natural reluctance to any change, the car makers are often unwilling to agree to even small changes. It was brought to the notice of the Committee that some of the components which could be made interchangeable between all the three cars are door handles, door mechanisms, window regulators, weather strip sections, head lights, tail lamps, trafficators, wipers, wiper mechanism, steering wheel, gear change lever, various fasteners and bushes hand brake cable, self-starter, etc. It was also said that with slightly greater modification of the car design, certain proprietary items such as dynamos, distributors, fuel pump, clutch, ball bearings, oil seals, etc., could also be made interchangeable between the three cars. The steps recommended by the ancillary producers would, in their opinion, not only lead to the availability of spare parts of better quality but also eventually lead to reduction in cost.

14.5.2. The Committee has considered the above suggestions very carefully. The view of the car makers is that even a small change in some cases involves very heavy expenditure in the change in tooling & sometimes in the basic design itself. However, this is an important matter which is well worth considering. The Committee would, therefore, suggest that the Associations of all the Car Makers and ancillary industries should meet together and discuss the various issues dispassionately and arrive at mutually satisfactory solutions and arrangements. ISI could then be requested to develop standards for such parts and their manufacture could eventually be started on a bigger scale, leading to better components and reduction in cost.

14.6. It is important that the car makers should provide proper and detailed specifications and other facilities to the ancillary industries, in order to guide them to produce components conforming to the required standards. The Indian Standards Institution has already published about 90 Indian Standards relating to raw materials and components for automobiles. Besides, 70 Indian Standards are under preparation.

14.7. The Committee during its visit to the car makers' plants made pointed enquiries regarding the research and development work conducted by them in the field of automobile industry. The

Committee regrets that very little of worthwhile research and development is taking place in this industry. By and large the designs and specifications furnished by the collaborators are being followed in toto by the car makers. The Committee feels that one of the main reasons for a number of complaints is the fact that present designs followed by the manufacturers do not suit Indian conditions. Examples of this kind are rubber components which have to withstand severe atmospheric conditions, shock absorbers and springs which have to take higher duty, due to our road conditions and social habits, leading to frequent overloading of cars.

14.8. The industry needs considerable technological assistance for its future development. The phase of foreign collaboration is almost coming to an end. Nevertheless there should be free flow of technological information and knowledge between India and the overseas countries. Research and development activities in this country have to be generated at a very fast rate if the gap between technological advances abroad and in this country has to be bridged. The different units of the car industry must gradually develop their research and testing departments to a good extent. All the same, there is need for setting up of a research and development centre at the national level. As far as the facilities at the industrial level are concerned, the Committee was informed that a beginning has been made for the formation of a Research and Development Organization under the auspices of the Indian Automobile Association. Though this idea was mooted in 1956 by the Tariff Commission, the Committee is constrained to observe that no tangible progress has been made so far. It is important that a well organised and co-operative research centre is established without delay and as was envisaged, the industry should be made to contribute a minimum percentage of their turn-over, with a matching grant by the Government of India, for financing this co-operative research centre. The Central Mechanical Engineering Research Institute, Durgapur, should be closely associated with the functioning of this research centre. The scheme should be processed with urgency and, in the intervening period, use should be made of the facilities already available with the research institutions in the country, particularly with the Central Mechanical Engineering Research Institute. The Committee was also informed that until such time as the research and development organization is established, a few samples selected at random from the production line of the car makers—could be tested for endurance and such other trials that could take place under the auspices of the Ministry of Defence. The proposal is understood to have been accepted in principle by the car makers. It is a desirable development and the Committee strongly recommends that this decision should be implemented immediately.

14.9. The assistance of other national laboratories, such as Indian Institute of Petroleum, Dehra Dun, which is working on oils and lubricants, and Central Electro-Chemical Research Institute, Karaikudi, which is also working on projects of interest to the automobile industry, should be availed of by the industry.

14.10. As stated earlier, apart from dimensional and quality requirements, it is important that the components satisfy performance requirements. Also, the life of these components should be evaluated. For this purpose, it is necessary that all the ancillary industries should have proper life testing rigs. These can be designed and fabricated easily and without much cost. Such rigs should preferably be installed at the car makers' plants in order to evaluate the performance of the bought out components and also to make sure that the components that they are getting are of standard quality and stand up to the performance requirements. The assistance of the Central Mechanical Engineering Research Institute could be taken to design and fabricate these rigs.

14.11. It is also important that the makers should establish a proper system of collection of data, from the field, with the assistance of their dealers and their representatives in different parts of the country, with regard to performance of their cars. The information regarding the performance and failures should be fed back to the car makers and also to the ancillary industries, with a view to analysing the causes of such complaints and failures, for taking corrective measures. This would also assist in modifying the standards that the car manufacturers and ancillary industries are following at present.

CHAPTER 15

SHORT-TERM AND LONG-TERM SOLUTIONS FOR RESTORING QUALITY

15.1. The development of the two main constituents of the automobile industry, namely, the car makers and the ancillary producers, has been dealt with in the relevant chapters. The extent of deterioration in the quality of passenger cars, the nature of complaints, the circumstances which have led to this deterioration, and the remedial measures to be taken to improve the present situation have also been dealt with in the earlier chapters.

15.2. The reasons for the deterioration in the quality of cars can briefly be summarized as follows—

(a) Demand far exceeding supply, thus creating a seller's market;
(b) Inadequate implementation of inspection and supervision procedures at all stages, and near total lack of quality consciousness and quality control among the car makers and most of the ancillary producers, at all levels, from the purchase of raw materials right throughout the processes of production and assembly, up to the completion of the final product;
(c) Difficulties in obtaining the right type and quantities of raw materials;
(d) Lack of proper purchase policies of the car makers, ancillary producers and their suppliers;
(e) Many of the ancillary units not having adequate technical know-how, esuipment and testing facilities;
(f) Inadequate pre-delivery inspection by the car makers before handling over the car to the dealer and likewise by the dealer to the user;
(g) Sufficient precautions not being taken in the transportation of cars by road;
(h) Government policies of imposing severe restrictions for import of cars with a view to providing incentive for the development of the indigenous industry which reduced competition; and finally,
(j) Government policy of price control without any reference to quality.

15.3. Many defects that have been noticed in the past few years are such that they could have been easily avoided with little effort on the part of the ancillary producer, the car maker or the dealer. Examples of these are improper body alignment, hard closing of doors, loose bolts and nuts, chipping off of paint from certain parts of the body, incorrect wheel alignment, non functioning of head and tail lamps, etc. There are certain other defects such as those relating to steering gear, clutch and brake assemblies which need special attention. It is now proposed to put together in this Chapter certain short-term measures which if effectively implemented forthwith, will improve the quality of the cars to a large extent within a period of six months. The long-term measures, outlined subsequently will assist in improving the overall quality of the cars to the desired degree. Some of these long term measures may yield results in the course of a year but others may take a longer time. These measures apply to all the three makes of cars.

15.4. For facility of reference, the short term measures have been classified into 3 sections meant for the guidance of the Ancillary Producers, the Car Makers, and the Dealers respectively. These are really ordinary commonsense practices but have been indicated in detail only because they are not being fully followed.

15.5. Measures to be taken by the ancillary producers are—

(a) Strict inspection control must be enforced on the purchase of raw materials and semis required for the manufacture of ancillary products;

(b) There should be equally strict supervision on the manufacturing processes as per procedures laid down for quality control,

(c) The final testing of the end product should be done meticulously and care should be exercised to see that only such components are supplied as have passed all the tests satisfactorily;

(d) Proper procedures for preventive maintenance and timely repair of machinery and equipment should be laid down;

(e) All complaints received against the components should be properly investigated and changes made in the specifications and/or processes where necessary;

(f) Every ancillary supplier should be required to furnish a test certificate regarding the quality of his product, based on the tests conducted in his own laboratory or by any other competent authority. He should also guarantee its performance for a definite period of time;

(g) The industry should immediately initiate action for geting ISI certification marks for the vital components so that their manufacture is started on the basis of the standards prescribed by ISI: and

(h) The Association of the All India Automobile and Ancillary Industries should impress on their members the need to observe all the prescribed procedures for quality production and defaulters disaffiliated under public notification.

15.6. Measures to be taken by the Car Makers:

15.6.1. The measures indicated in para 15.5 items (a) to (f) apply mutatis mutandis to the car makers also.

15.6.2. Additional measures to be taken by them are:

(a) There should be strict supervision on the assembly processes and on no account should be rejected or sub-standard materials or components be used;

(b) Strict inspection control on the quality of bought out components from the ancillary producers should be enforced;

(c) The pre-delivery inspection at the car maker's plant should be thorough so that there is no room for complaints such as hard closing of doors, oil leakage from various assemblies, paint defects, and improper functioning of controls and instruments;

(d) The manufacturers must ensure that no cars are sent to the dealers with any deficiency of parts or fittings or tools, on the plea that they are in short supply and these would be fitted or supplied later;

(e) All vehicles that are transported by road must be fitted with an efficient speed governor and tamper proof seals;

(f) The car makers must notify, for the information of all the users who have been sold the particular batch of cars, any manufacturing defects subsequently noticed in any component or sub-assembly, whether made by them or bought out, so that each of the users may have opportunity to take his car to the dealer, to get the defect rectified or have the defective component replaced immediately;

(g) The car makers should make available to the dealers and car users a list of components which are bought out and have been fitted as original equipment, giving the names of the ancillary producers. This will help the user to get the replacement parts of proper quality;

(h) The warranty period should be extended to 12 months or 16,000 KM (10,000 Miles) whichever occurs earlier. The present warranty should also be modified to include a provision that the entire cost of replacement of the defective parts will be borne by the car maker/dealer, including the fuel, oil, gaskets, etc., used in the rectification process;

(j) Modification of the present system of allotment of a fixed quota for each dealer. Registration of requests for cars should be done by the regional representative of the car makers giving the option to the user to register with any dealer of his choice in his area. It is expected that this would result in the dealer giving satisfactory service to the users, during and after warranty period, as otherwise no user would go to him for buying a car;

(k) Institution of the Technical Audit for performance assessment as proposed elsewhere in the Report, be immediately effected in all the car makers' plants. The scope of the Technical Audit may be extended in course of time to concerned units of the ancillary industry either individually or collectively as and when the situation warrants.

15.7. Measures to be taken by the dealers—

(a) Pre-delivery inspection at the dealer's point should be exhaustive and all the defects should be removed before delivery;

(b) The dealer should not only promptly attend to the complaints received during the warranty period but he should also be authorized to take decisions without consulting the car maker, or his regional representative, or the ancillary industry, for replacement of defective components;

(c) Every dealer should have adequate servicing facilities. There should be provision of wheel alignment equipment, torque wrenches, and engine analysis; and

(d) The dealers while replacing defective parts during the warranty period should not use any part other than that used in the original equipment.

15.8. The long-term measures to be adopted for improving and maintaining the over-all quality of the cars, are detailed below. Some of these items apply in the case of the ancillary producers also but these have not been separately classified:

(a) Continuance of the technical audit system, suggested under the short-term measures, with such modifications as might be necessary in the light of the experience gained in the course of three to six months and extending it to some of the ancillary units, either individually or collectively chosen for the purpose;

(b) Laying down a proper system of quality control and inspection methods, to be followed at all levels, in the car makers plant as well as in the ancillary producers units;

(c) Enforcing strict inspection control on the quality of raw materials purchased by the car makers and the ancillary producers;

(d) Enforcing strict inspection control on the quality of bought out components from the ancillary producers;

(e) Augmenting the existing testing and quality control facilities both at the car makers' plant and at the ancillary producers' units. In particular, test rigs for evaluating the performance of the components should be established for all the components;

(f) Training top officials, particularly of the Inspection and Quality Control Departments, in modern management techniques;

(g) Making staff, at all levels, quality conscious through periodicals, lectures, demonstrations and posters;

(h) Establishment of proper statistical sampling procedures for different raw materials and components, taking into consideration their importance, cost and the nature of the characteristics to be determined;

(j) Establishment of national and company standards for raw materials and components that go into the making of the car and to make as many components as possible interchangeable amongst the three car makers, within a period of about three years. Where necessary, association standards should be established by organizations like the Automobile Association of India and the All India Automobile and Ancillary Industries Association;

(k) Making the ISI Certification Mark compulsory for all **raw** materials and critical components that go into the **making** of the car;

(m) Establishment of a research and development section in the plant, of every car maker and in the units of all large-scale ancillary producers for proving their products, effecting design improvements, developing new designs and analysing complaints received for taking corrective measures;

(n) Speeding up the establishment of a fullfledged research and development organization which has already been envisaged, a beginning to be made within a year and completed within 5 years. In the intervening period, proposals under consideration to test vehicles selected at random, under the auspices of the Ministry of Defence, should be implemented;

(p) Evolving mutually acceptable test and acceptance procedures between the car makers and the ancillary producers and their suppliers;

(q) Laying down proper and uniform purchase and payment policies and contractual agreements between the vendor and the suppliers on a long term basis, thus leading to better relationship between the car maker and the ancillary producers and their suppliers. Necessary provisions for penalties and compensation for non-compliance should be introduced in these agreements to ensure consistency and timely supply of materials and components;

(r) Development and fabrication of special two-tier bogey wagons by the Railways for transportation of multiple cars and reducing the present practice of transportation of cars by road; and

(s) Making it obligatory that all spare parts to be marketted should be suitably labelled, indicating the maker's name, warranty and also the price.

15.9. To finance the development of research and testing in the automobile industry, in the country, the industry should be made to contribute atleast one percent of their total turnover with a matching grant by the Government; a cooperative Research and Development Association should be established at an early date for this purpose.

15.10. The Government may also consider giving a rebate on the tax collected from the car makers and the ancillary producers in proportion to the expenditure incurred on inspection and quality control.

15.11. The proposal made elsewhere in this Report for permitting the car makers to market another model which could be termed the 'Deluxe' model merits serious consideration.

CHAPTER 16

WARRANTY

16.1. Warranty is an expression of faith in one's product implying that the product sold is fit for use and it fulfils certain specific expectations. It is customary in the car industry in India and elsewhere for the car maker to cover the cars sold with a warranty. Under the warranty, all flaws arising out of faulty manufacture or workmanship are rectified and, if necessary, defective parts replaced free of cost by the car maker or his dealers, within the specified period or the minimum distance traversed. During the warranty period, a certain number of free services as detailed in the warranty is also undertaken by the dealers on behalf of the car makers.

16.2. In foreign countries warranty terms differ amongst the different car makers. In U.K. the general practice appears to be to keep the warranty valid for a period of 12 months or a distance covered of 19,200 Km (12,000 miles) whichever is earlier. In USA some of the car makers provide a warranty extending to even 24 months/38,400 Km (24,000 miles) whichever occurs earlier.

16.3. In India, the warranty furnished by the different car makers is valid to the extent given below—

Name of the Car Maker	Period/Distance traversed (whichever is earlier)
Hindustan Motors	12 months/16,000 Km (10,000 miles)
Premier Automobiles	180 days/10,000 Km (6,250 miles).
Standard Motor Products of India	6 months/9,600 Km (6,000 miles).

16.4. In all the above cases, the warranty includes three free services during the warranty period and replacement of defective parts arising during this period free of cost, but the car owner has to pay for consumable items like oil, grease, packings, etc. The warranty, however, does not include such items as tyres, tubes, battery and bulbs. The car makers have entered into agreement with several ancillary component manufacturers that they, in turn, provide the same warranty as the car makers for the original equipment supplied by them and fitted in the car.

16.5. While the dealer is empowered to replace defective parts in most of the cases, he has to wait for the decision of the ancillary supplier or the local representative of the car maker before agreeing to rectify defects and/or to replace faulty parts on the basis of complaints of the user during the warranty period. Examples of such cases are painting of the car, replacement of starter motor, wiper motor, etc. This often leads to considerable delay, causing inconvenience and annoyance to the customer.

16.6. The Committee does not see any justification for the present differences in the warranties offered by the three car manufacturers. Since a warranty is an expression of faith in one's product, there does not appear to be much reason, particularly in the present circumstances, when such a heavy investment is involved on the part of the buyer, that the manufacturer should not assure of the performance of his vehicle in a trouble-free manner for a reasonable length of time after its sale. As a means of indirectly pressurizing the car manufacturers to improve the quality of their products and as a demonstration of their professed goodwill to the users, the Committee would recommend that the warranty to be given by all the three car makers should cover a period of one year after sale or 16,000 Km (about 10,000 miles) whichever occurs earlier.

16.7 The Committee would also recommend that the other provisions in the warranty should be revised, to stipulate clearly, that all expenditure relating to replacement of faulty parts and rectification of defects during the warranty period, including labour charges, shall be on the account of the manufacturers or their dealers or both, and that no part of the burden should be transferred to the users. For example, if an assembly has to be opened for replacing a defective part, fuel, oil, gaskets etc. should be replaced free of cost.

16.8. Furthermore, in operating the warranty satisfactorily and to avoid unnecessary hardship to the user, full powers should be delegated to the dealers to decide the course of action to be taken, for the replacement of parts and rectification of defects during warranty period, without his having to wait for a decision of the car maker or ancillary component supplier.

CHAPTER 17

DEALERS

17.1. The dealer is an important link between the car maker and the customer as, normally, it is only through him that a motor car is sold to the user. It is only the dealer, or his nominee, the sub-dealer, who has direct contact with the customer. He has, therefore, the responsible task of fulfilling the conditions laid down in the warranty given by the car maker to the satisfaction of the customer.

17.2. Each of the car makers has a network of dealers and sub-dealers throughout the country. Depending upon the number of cars manufactured and the regional distribution, the car maker may appoint more than one dealer for an area. The sub-dealer ordinarily works under the instructions and patronage of the main dealer but is appointed with the consent of the car maker. However, in many of the cases, the sub-dealer does not have all the facilities to attend to the needs of the customers and, in such cases, he has to obtain the assistance of the main dealer, both with regard to skilled personnel and workshop facilities. In addition, the car makers also have their regional offices and representatives in many of the major cities to keep a watch and control on the dealers and to see that they are well-equipped with tools, men, and materials. Further, they are expected to investigate into the customers' complaints and impart technical know-how to the dealers' personnel. These officers can play a vital part in keeping the dealers alert and uptodate.

17.3. The Hindustan Motors have 124, the Premiers 74 and the Standard Motors 52 dealers and sub-dealers in the country. The Committee was given to understand that the selection of dealers and sub-dealers is mainly based on the following considerations:

(a) Financial ability,

(b) Location of workshop and servicing facilities for the cars, and

(c) Experience in the field.

It is needless to emphasize the necessity of a careful initial selection and a periodical check of their workshops by the car maker.

17.4. The dealer is expected to make advance payment for the cars before taking them over at the factory and make his own arrangements for transporting them to his area. He is to carry out detailed pre-delivery inspection before handing over the car to the customer in proper working condition. During the warranty period he has also to do a fixed number of free servicings to the car as stipulated therein and also rectify all defects and attend to complaints received from the customer during this period. The agreement between the car manufacturer and the dealer is such that any part needing replacement during the warranty period due to manufacturing defect will be changed by the dealer. The car maker reimburses the dealer the cost of the component but the labour cost for replacing the part is borne by the dealer except that in the case of the Standard Car the dealer is reimbursed for the cost of labour also, on the basis of the car maker's schedule. All the labour cost for the free servicings done during the warranty period is borne by the dealer The dealers/sub-dealers are also expected to keep in stock sufficient number of approved spare parts so that in case these have to be replaced during the warranty period, the work could be done expeditiously.

17.5. The Committee visited some of the dealers in Delhi, Bombay, Calcutta, and Madras, with a view to finding out the type of facilities they have and the type of service they are giving to the customers. Discussions were held with them on various matters including the relationship that exists between them and the car makers. A study was also made of the manner in which they dealt with user complaints. An examination was made of records kept, which were far from satisfactory in most of the cases. The Committee felt that the facilities with many dealers for servicing and repairing of cars should be augmented with the provision of some essential items like torque wrenches, engine analysers, wheel balancing and wheel aligning equipment, etc.

17.6. The essence of full customer satisfaction is the detailed pre-delivery inspection. It must be carried out thoroughly yet, by and large, this is not done. Inspection reports on such checks should also be sent to the car maker. A case history of each car should be maintained until the warranty period is over, indicating all the complaints received, the defects rectified, and the parts replaced. Combined with the initial inspection report, this will be most valuable as a feed back information to the car maker for improving his vehicle.

17.7. The Committee found that one of the dealers in the South took great pains to make a detailed pre-delivery inspection of all the cars received from the car maker, before handing over the cars to his customers. In fact, the Committee learnt that this dealer had also deputed one of his managerial staff to the factory of the car maker to get many of the defects, arising on the assembly line itself, set right before despatch. It was amazing to find the number of defects that still remained to be attended to when the Committee visited his workshop. Records of work done on each car was also maintained meticulously by this dealer. The Committee has received very helpful suggestions from him as also from a few others.

17.8. The customers are bitter against the attitude of most of the dealers to their complaints. Their general behaviour has been characterized as one of apathy rather than understanding. Some of them do not have even the necessary workshop facilities. It has been alleged that complaints are not promptly attended to and customers have often to come to the service station several times before defects are rectified. Even after these have been attended to by the dealer, some defects continue to reappear. Spare parts are not stocked in adequate quantities with the result the customers have sometimes to wait for long periods for replacements. It has been alleged that additional charges have to be paid by the user now and then on some pretext or the other. Replacements have also been alleged to have been made sometimes with locally available non-genuine parts.

17.9. Considerable delays occur, such as the replacement of starter motors, where the ancillary producer has to be consulted before the defective sub-assembly is replaced. as the ancillary manufacturer is under warranty with the main manufacturer. In some other types of replacements, dealers are not allowed to undertake them unless the car makers or their representatives have been consulted. All such restrictions hamper the course of quick and efficient service to the customer and the Committee is of the opinion that the delegation of full authority to the dealers, in respect of replacement of components, will alone remove this sort of dissatisfaction.

17.10. Many consignments of the cars are brought by the dealers by road. The Committee was told that adequate care is not taken during these journeys. These are brought in convoys driven by drivers on a lumpsum contract basis. These cars are alleged to be driven at much higher speeds than the specified speeds set by the car makers during the running-in period. Consequently, major faults are said to arise during the life of the car due to this negligence. No doubt two of the car makers fix a governor to each car to prevent the driver from speeding but it has been alleged that the arrangement is not proof against tampering. The Committee would like this allegation to be examined by the car makers and steps taken to install a better type of governor which cannot be tampered with.

17.11. During the course of discussions with the dealers several of their problems and difficulties were brought to the notice of the Committee. These concerned mostly with their business interests. However, they admitted that the quality of cars had deteriorated during the last 2-3 years and that the supervision while assembling the car, as also the final inspection at the car makers' plant, was not as thorough as it should be, with the result that the cars are received with many defects which should not have been there. They also complained that many of the present owner drivers, as also the drivers engaged by car owners, did not understand much about the mechanism of the car and used it hardly resulting in many avoidable complaints and frequent visits to the dealers garages.

17.12. On purely business side they stated that they had to collect the cars from the manufacturers by paying the price in advance and that, inspite of the large waiting list, the time lag between payment to the car maker and its collection from the purchasers was 30 to 40 days. This meant heavy investment charges. They had also to keep a large assortment of components and the obsolescence of spare parts is very high. The cost of maintenance of the cars during the warranty period, that devolves on the dealer has become very high now on account of the frequency caused by the deterioration in quality and the rising costs of labour. On top of all this, some of the dealers have also to collect a minimum number of commercial vehicles made by the car maker, whose sales are coming down. The margin of their profit, out of the commission that they receive, and which has remained unchanged for 10 years now, has thus considerably eroded. It was admitted by many that this naturally affected the promptness and thoroughness of their after sales service.

17.13. While the Committee has recorded above the dealers' points of view, it is precluded from making any recommendation in this respect, as the matter is currently under the consideration of the Tariff Commission. However, they cannot but deprecate the fall in the standard of aftersales service rendered to the customer, who feels the indifference of the car maker and the dealer all the more because of the almost exhorbitant price that he has now to pay for his car.

17.14. It came to the notice of the Committee that instances have occurred where cars have been sold short of some fittings or accessories, tools, etc. In a dealers' show room the Committee observed a new car ready for sale without a finisher on the body. In reply to a question by the Committee as to how this had happened, the answer was that the car maker did not have this fitment at the time of despatch.

17.15. The Committee feels that there are certain serious disadvantages to the customer under the present motor car control order. The customer has to register himself for the purchase of a car with a dealer and accept delivery of the car from the same dealer. Under this system the customer has no recourse when he finds that a dealer is not capable or quick in the service he provides. In the Committee's opinion the registration for the purchase of a car should be made with the regional representative of the car manufacturer and, when the delivery is to be effected, the customer should stipulate the dealer through whom the car will be accepted. This will lead to enhanced competition and better service from dealers.

17.16. The Committee would now like to deal with an entirely different class of dealers, namely, the vendors of spare parts. This category of dealers is also a very essential appurtenant to the automobile industry. They serve even a far bigger clientele than the class of dealers previously mentioned with whom the car owner comes in intimate contact mostly during the warranty period. These vendors have to cater for the needs of all the vehicle owners throughout the life of the vehicles and, in even a greater measure, since, as the vehicle grows old, it needs more spare parts to keep it moving.

17.17. There is a total of about 4,000 vendors of spare parts who are affiliated, through their respective associations, to the Federation of All India Spare Parts Dealers Associations. It is assessed by the Federation that about 1,00,000 persons are employed in this trade. It has also been estimated by the Federation that the total investment made by such dealers is of the order of Rs. 500 million and turnover of their business is of the order of Rs. 100 million. They thus contribute substantially to the well being of the industry and the country.

17.18. However, in such a big organisation, while there are many reliable vendors, there is also an irresponsible class, which not only goes in for the purchase of components rejected by the car makers but also keeps in touch with the manufacturers of spurious parts. Such components command a sale on the basis of their low prices. As a safeguard against the purchase of spurious parts by discerning owners, the Committee has recommended that the car makers should give a detailed list of all the original equipments which they fit in their cars so that the car owners are able to select the spare parts required by them with care and confidence.

17.19. While it is correct that it is not possible for the spare parts dealers to exercise any test or check on the quality of the components purchased by them from the ancillary units, they should be induced to make their purchases only from recognised ancillary producers. This will, to some extent, mitigate the practice of spurious and sub-standard components being vended. The spurious branding and cartoning of such sub-standard parts is also for them to check. However, in such cases again, with proper care, much of the spurious stuff could be eliminated from the markets. This problem will be greatly controlled if the implementation of the ISI Certification Marking Scheme is employed widely for all products, as has already been mentioned elsewhere in the Report. The producers of the components have legal remedies against such deception which they should use relentlessly. The Committee has noted that the Federation has laid down a code of conduct for its members which, if followed, would go a long way in reducing the complaints against the vendors dealing in spurious parts but the Federation should also take active steps to publicly disaffiliate the unscrupulous vendors.

CHAPTER 18

SPECIAL ASPECTS: ASSOCIATIONS, LABOUR, SAFETY, INCENTIVES

18.1. In this Chapter, it is proposed to deal with certain special aspects of the automobile industry. These relate to the part played by the associations, labour policies and relations, safety aspects and incentives to the car makers for improving the quality of their vehicles.

18.2. *Associations*—Associations that have been formed to look after the interests of the various sections of the automobile industry should provide a forum for discussion of common problems, exchange of experience and for evolving policies for the promotion of satisfaction of their customers.

18.2.1. Some of the concerned Associations are—

(a) Association of Indian Automobile Manufacturers,

(b) All India Automobile and Ancillary Industries Association,

(c) Federation of Automobile Dealers Association, and

(d) Federation of All India Automobile Spare Parts Dealers Association.

The two notable achievements of the Association of Indian Automobile Manufacturers are the rationalization of steels for the automobile industry, which they have done in collaboration with the Indian Standards Institution and the efforts that they are making for establishing a research and development association. The All India Automobile and Ancillary Industries Association has conducted a pilot survey to determine the life of automobile components. They have also recently instituted an award for the best quality control methods adopted by any of their associates in the country. Other Associations seem to be mainly confining themselves to promoting the sectional interests of their members.

18.2.2. Such Associations, by laying down proper codes of conduct for their members, can assist in eliminating unhealthy competition and maintaining quality of their products, thus giving complete customer satisfaction which would ultimately assist the proper growth of the industry. It is important that they should strictly enforce the code of conduct laid down for the members, even if it becomes necessary to disaffiliate any of them for its non-compliance. Another important contribution these associations can make is utilization of the spare capacities among its members fully and also avoid duplication of their facilities in the national interests.

18.3. *Labour Policies and Relations*—During the discussions with the management of car makers, it was brought out that some of the present Government labour policies were coming in their way of getting the best out of their men, with the result that they were unable to achieve quality and productivity. Further, the managements also pointed out that the present trend was that the worker did not have pride in his job. On the other hand, the discussions with some labour representatives revealed that much of the unrest was due to lack of adequate amenities provided for the workers, improper working conditions in the plants, and absence of awards and incentives. Under these circumstances, they could not be expected to be quality conscious in a big way. It was also brought to the notice of the Committee that their job evaluation was perfunctorily done, and that even the supervisory staff were frequently transferred from one department to another. The Committee feels that proper conditions of working, adequate amenities, awards and incentives should be provided to the workers so that quality consciousness could be instilled in them.

18.4. *Safety Aspects*—The present system of issuing of driving licences should be revised to include an examination to test the driver's knowledge about the working of the motor car, its maintenance, the various road signs and safety rules. In many of the overseas countries, a thorough training is imparted to the prospective driver and a detailed test is taken before the driving licence is issued. A similar procedure would not only lead to correct driving habits but also ensure safety against serious accidents.

18.4.1. Every car maker supplies literature which given the schedule of servicing and hints for the proper maintenance of the car at the time of selling a new car to the customer. It is essential that the users follow scrupulously the instructions given by the car maker if they want a trouble-free service. It is also important that the defects noticed, however small they may be, should be attended to promptly, as they may lead to serious defects if neglected at an early stage. The Committee found, during the course of its deliberations, that some of the complaints made by the users have stemmed from the fact that the instructions given by the manufacturers, with regard to service and maintenance of the cars, are not being followed.

18.5. *Incentives to the Car Makers for Improving the Quality*—The Committee has already referred elsewhere in the Report to the incentives to be given to the car maker in the form of a tax rebate in proportion to the expenditure incurred by the car makers and the ancillary producers on inspection and quality control. The Committee is of the view that the car maker could also be provided with an element of a built-in technological incentive to enable him to improve the quality of the car.

18.5.1. *Deluxe Model*—In order to provide such an incentive, the Committee feels that once all the recommendations made by this Committee are implemented in the manufacturing programmes of the car makers, the three car makers should be asked to submit to Government an improved version of their present cars, built with such additional fittings, modifications and finish as they may like to incorporate. Such vehicles, while remaining basically the same as are being currently produced, could be designated as the 'deluxe models'. After the Government is satisfied that necessary steps have been taken to ensure maintenance of quality standards during normal line production in the plants, and after Government have accepted such versions as being worthy of being designed 'deluxe models' the car manufacturers may be permitted to produce such 'de luxe' versions and to market them without any restrictions on price or distribution. The only limitation to be imposed should be that de luxe versions can only be produced or marketed in excess of the present levels of production, or be a specified percentage of the present production, as Government may decide.

CHAPTER 19

SUMMARY OF THE REPORT

19.1. In view of the widespread complaints made about the quality of the motor cars manufactured in India, the Government of India set up the Motor Car Quality Enquiry Committee to make an investigation into the extent of the deterioration in the quality of motor cars, the circumstances which led to the deterioration and the reasons therefor, and to investigate whether the undertakings have laid down minimum standards for quality and performance for all that they make and buy from others. The Committee was also asked to examine whether the equipment facilities and arrangements with each car maker were adequate for proper testing, inspection, and quality control of what they make and what they buy, and to indicate what additional assistance was needed. The Committee was further asked to investigate the extent to which the ancillary and other industries were responsible for the deterioration in the quality of the cars and what steps were required to be taken to improve their quality and performance. The effectiveness of the warranties and the aftersales service, rendered by the dealers were also to be investigated, and finally, the Committee was asked to indicate necessary and feasible steps that should be taken by the Central Government to ensure the maintenance of minimum standards of quality by the manufacturers.

19.2. The Committee issued questionnaires to the car makers, ancillary manufacturers, and the dealers to elicit the necessary information concerning their work and activity, their deficiencies and their needs. A questionnaire was also issued to the users to get from them information about the complaints in respect of their cars. Detailed discussions were also held with various interests.

19.3. The automobile industry in the country started with the assembling of imported completely knocked down packs and, later on, a beginning was made by one of the car makers to manufacture a few components in his plant. However, accepting the recommendations of the Tariff Commission in 1953, the Government gave protection to the automobile industry and stipulated that there should be a regulated ban on the import of components to encourage indigenous production.

19.4. The Committee has made an analysis of the data regarding complaints received from the car makers, the dealers as also what was reported directly to the Committee by the users. The analysis of the data has clearly brought out that there has been a progressive deterioration in the quality of cars during the last two years. In view of the several factors involved, it would, however, not be possible to quantitatively estimate the extent of deterioration except to say that in the last two years the deterioration has been more pronounced.

19.5. The circumstances and reasons for the deterioration could be summarised as demand far exceeding supply, thus creating a seller's market; near total lack of quality consciousness among the car makers and most of the ancillary producers; lack of well defined supervision, inspection and quality control procedures, and non-implementation thereof, at all levels from the stage of purchase of raw materials, right through all the processes of production and assembly, upto the completion of the final product; difficulties in obtaining the right type and quantities of raw materials; lack of proper purchase policies of the car makers, ancillary producers and their suppliers; many of the ancillary units not having adequate technical know-how, equipment and testing facilities; inadequate pre-delivery inspection by the car maker before handing over the car to the dealer and likewise by the dealer to the user; transportation of new cars by road without any speed limit being observed during the running-in period; governmental policies of imposing severe restrictions for import of cars with a view to providing incentive for the development of the indigenous industry which reduced competition; and finally, government policy of price control without any control on quality.

19.6. All the three car makers have, in principle, adopted, by and large, the standards furnished by their collaborators. While M/s Premier Automobiles and Hindustan Motors Ltd. have evolved reasonably good quality control and inspection systems, M/s Standard Motors do not have quality and inspection systems comparable to the other two.

19.7. From the visits to the car makers and discussions held with the dealers by the Committee, it was confirmed that there is a near total lack of quality consciousness in the management, staff and workers of all the three car makers. The inspection, supervision and quality control practices are unsatisfactory from the incoming raw material stage, to the assembly and production lines and right up to the finished product. The Committee has also concluded that often components are bought out on consideration of price rather than quality. No doubt the complaints received on the components manufactured by the car makers themselves are less as compared to those on bought out components.

19.8. The Committee has also noted that while M/s Premier Automobiles and Hindustan Motors Ltd. have facilities for routine testing of raw materials, M/s Standard Motors do not have many of these and they have to depend on other organizations for such tests. Perhaps, it is one of the reasons why M/s Standard Motors have dispensed with most of the testing and accept raw materials and components on the basis of their judgment of the capabilities of their suppliers. The Committee would, however, like to point out that none of the car makers has installed sufficient number of testing rigs to ensure performance of the components and also for evaluating the life of the functional components.

19.9. The ancillary industry has also played a considerable part in the deterioration of the quality of cars. Except for a few ancillary producers none of the others has proper procedures for inspection or quality control. Many of them do not have proper testing facilities and they buy raw materials on the basis of test certificates alone, which are also sometimes dispensed with. Many of them do not have any test rigs to determine the performance requirements or evaluation of their life. The Committee could not but conclude that the ancillary industries, which have been given more facilities than the car makers have not played their part equitably in maintaining the quality of cars. In fact, during the discussions many of them admitted having supplied sub-standard components to the car makers under pressure to keep production lines going.

19.10. The warranties given by the three car makers differ in essential respects. M/s Hindustan Motors give warranty for 12 months or 16,000 Km. (10,000 miles), M/s Premier Automobiles give warranty for 180 days or 10,000 Km (6,250 miles) and M/s Standard Motor Products of India give warranty for 6 months or 9,600 Km (6,000 miles), in each case whichever occurs earlier. Although under these warranties all the defective parts have to be replaced free of cost during the warranty period, in this respect also, many of the dealers are not giving proper service to the user. One of the main drawbacks is that in certain cases, even though the dealer is convinced that the part is defective, he either does not have the spare part, or he has to wait for a final decision from the car maker, or his local representative, and in some cases, even from the ancillary producer who has supplied the component. The pre-delivery inspection conducted by the car maker and also the dealer is deficient and many defects arise due to improper pre-delivery inspection.

19.10.1. The Committee has recommended that the warranty should be made uniform for all the three motor cars, and no cost of replacements, including incidentals, should be passed on to the customer.

19.11. The Committee has also recommended steps for the proper functioning of the spare parts market.

19.12. The steps that the Government should take have been discussed in some detail and the recommendations in this respect are that the Government should request the Indian Standards Institution to formulate, on a priority basis, standards for raw materials and components, with the cooperation and assistance of the car makers, ancillary industries, and their suppliers, and that the car makers should be directed to adopt and implement these standards as and when they are formulated. The ISI Certification Marks Scheme should be made compulsory for all the ancillary producers, on the basis of priorities. The Government should direct the public sector steel plants to take steps to make available raw materials required by the automobile industry, with the least delay, irrespective of the quantities involved. The Railways should also be asked to expedite the fabrication of special two-tier bogie wagons for transporting cars by rail. The Government should stop assistance to such of the ancillary producers whose products are found consistently sub-standard and take other corrective action. They should not also be permitted renewal of the foreign collaboration. In order to have the recommendations made by this Committee effectively adopted, the Government should institute technical audit cells in the car makers' plants to start with and, where necessary, to extend it to other ancillary units or groups thereof in order to arrest the deterioration in quality so as to give the customer trouble-free service. The Government should make foreign exchange available more liberally, and in time, for purchasing such raw materials/components as are not available in the country at present and also assist the industry in getting their men trained in overseas countries. The Government may also consider permitting the car makers to manufacture a deluxe model without price control, which will provide the necessary incentive for technological development and which is likely also to improve the quality of the cars now being manufactured. The Government should assist the industry to organize and set up without delay the cooperative research organization which has been long delayed, with adequate financial assistance. An incentive should also be given in the form of a rebate on the tax collected to the producers, in proportion to the expenditure incurred on inspection and quality control.

CHAPTER 20

LIST OF RECOMMENDATIONS

20.1. The nature and the extent of the defects leading to the deterioration in the quality of the Ambassador, Fiat and Standard Cars, have been dealt with in Chapters 6, 8 and 10 respectively. In subsequent Chapters, steps to be taken to arrest the present deterioration in the quality of these cars have been dealt with. In Chapter 15, the short-term and long-term measures to be adopted have been outlined. In this Chapter, major recommendations made in this Report are presented in a consolidated and summarized form for quick reference. For full details the relevant chapters may be consulted. The recommendations have been grouped under 4 heads, depending upon the party with which they are concerned, namely Car Makers, Ancillary producers, Dealers and the Government.

20.2. *Concerning Car Makers*—

1. The management should become fully quality conscious and instill this consciousness at all levels of their staff and workers, through periodical lectures, demonstrations, circulation of pamphlets, awards, and incentives.
2. The managerial staff should be given training in one of the organized institutes on modern management techniques.
3. Training courses in inspection and quality control techniques for the staff posted in these departments should be organised along with periodical refresher courses.
4. A separate Inspection Department manned by well qualified personnel should be established in each plant and should be directly responsible to the top management.
5. There should be a separate Quality Control Department manned by proper qualified personnel.
6. Every Plant should have a Company Standards Department to liaise with the Indian Standards Institution and also to lay down required company standards.
7. Proper inspection and statistical sampling procedures and statistical quality control methods should be evolved for adoption in the three plants.
8. Statistical control methods should be employed from the inspection of the incoming raw materials and components, through the assembly lines and right upto the finished products.
9. Indian Standards for raw materials, components, statistical quality control methods and test procedures should be followed wherever they exist. Raw materials and components carrying the ISI Certification Mark should be purchased wherever they are available.
10. Every plant should have adequate testing facilities for raw materials and components.
11. Test rigs for testing of performance requirements of components should be installed. Samples of bought-out components should also be continuously tested on test cars and

test tracks. Adequate number of test cars should be earmarked for this purpose.

12. The layout of some of the departments of the car makers should be revised whenever an opportunity arises to enable smooth flow of materials and components and to avoid duplicate handling.

13. A Research and Development Section should be established at each of the plants for re-designing components, developing new designs and analysing defects with a view to taking corrective measures.

14. The spare equipment capacity available should be allowed to be utilized by other plants/ancillary producers.

15. Detailed and specific requirements of standards should be furnished to the ancillary producers in addition to making available to them the testing facilities at the car maker's plant.

16. Proper and uniform purchase and payment policies and contractual agreements should be laid down between the car maker, the ancillary producer and their suppliers, on a long term basis. Necessary provisions for penalties and compensation for non-compliance should be introduced in these agreements to ensure consistency.

17. All materials should be accepted after proper inspection and testing, and not on the basis of previous supplies or brand names.

18. A thorough pre-delivery inspection of all cars should be made by the car maker before delivery to the dealer.

19. No car with deficient supplies of parts should be sold to the dealer. Cars should have the stipulated service tools of proper quality.

20. Tamper proof speed governors should be fitted to the cars to minimise reckless driving of the cars from the car maker's plant to the dealer's establishment.

21. Proper procedures for preventive maintenance and timely repair of machinery and equipment should be laid down.

22. A proper system of collection of field data with regard to the performance of passenger cars should be evolved so that information regarding complaints, defects and failures is fed back to the car maker with a view to analysing their causes and also for taking corrective measures.

23. The warranty with which cars are sold should be uniformly valid for a period of 12 months or a distance covered of 16,000 kilometres, whichever occurs earlier. Also, all defects due to faulty manufacture or bad workmanship should be rectified and defective parts replaced during this period without passing any part of the burden, including incidental charges, to the customer.

24. Car makers should evolve a proper procedure for disposal of rejected material and parts so as to ensure that they do not find their way back to their plants.

25. The car makers, together with the ancillary producers should try and develop as many inter-changeable components as possible for the three cars in order to increase productivity, reduce cost and improve quality.
26. The dealer's workshops should be visited periodically by the car maker to ensure that the spare parts that go into the original equipment are being stocked, for use during the warranty period.
27. When defects in critical components are reported from the field, the owners of all cars from that batch should be notified so that the cars are brought immediately to the nearest dealer's service station for check and rectification of defects.
28. The car makers may be induced to give up the production of certain components which they are currently manufacturing, which could more profitably be manufactured by the ancillary producers.

20.3. *Concerning Ancillary Industries*—Many of the recommendations made for car makers apply equally to the ancillary producers also. For case of reference such common recommendations have also been reproduced below along with other recommendations which relate specifically to ancillary producers.

1. The management should become fully quality conscious and instill this consciousness at all levels of their staff and workers, through periodical lectures, demonstrations circulation of pamphlets, awards and incentives.
2. The managerial staff should be given training in one of the organized institutes on modern management techniques.
3. Training courses in inspection and quality control techniques for the staff posted in these Departments should be organized along with periodical refresher courses.
4. A separate Inspection Department manned by well qualified personnel should be established in each unit and should be directly responsible to the top management.
5. There should be a separate quality control department manned by proper qualified personnel.
6. Each unit should have a Company Standards Department to liaise with the Indian Standards Institution and also to lay down required company standards.
7. Proper inspection and statistical sampling procedures and statistical quality control methods should be evolved for adoption in each unit.
8. Statistical quality control methods should be employed from the inspection of the incoming raw materials and subcomponents through the assembly lines and right upto the finished products.
9. Indian Standards for raw materials and sub-components, statistical quality control methods and test procedures should be followed wherever they exist. Raw materials and sub components carrying the ISI Certification Mark should be purchased wherever they are available.

10. Each unit should have adequate testing facilities for all raw materials and components. Alternately, where possible, a group of ancillary units should establish testing facilities for use by all of them.
11. Test rigs for testing of performance requirements and evaluating the life of the components should be installed.
12. A Research and Development Section should be established at each unit for re-designing components, developing new designs and analysing defects with a view to taking corrective measures.
13. Proper and uniform purchase and payment policies and contractual agreements should be laid down between the ancillary industry and their suppliers.
14. All material should be accepted after proper inspection and testing and not on the basis of previous supplies or brand names.
15. A proper system of collection of field data with regard to the performance of their components should be evolved so that information regarding complaints, defects and failures are fed back to the producer with a view to analysing their cause and also for taking corrective measures.
16. The ancillary producers together with the car makers should try and develop as many interchangeable components as possible for the three cars in order to increase productivity, reduce cost and improve quality.
17. Proper procedures for preventive maintenance and timely repair of machinery and equipment should be laid down.
18. The All India Automobile and Ancillary Industries Association should devise ways and means to make its constituents observe the code of conduct evolved by it under pain of being disaffiliated under public notification if there is a breach of it by any producer.

20.4. *Concerning Dealers*

1. Every dealer should have proper equipment and adequate facilities for servicing and repair of the cars as recommended by the car maker.
2. A dealer should have adequate stock of such parts as are used in the original equipment and should use no others for replacement of defective parts during the warranty period.
3. The pre-delivery inspection should be thoroughly done and all defects rectified before delivering a car to the customer.
4. The dealer should make available a list of charges for standard jobs to the user.
5. The dealer should ensure that the cars transported by road do not exceed the speed limits specified by the car maker to minimize defects arising during their transportation.
6. The dealer should be given full authority to settle complaints regarding defective parts irrespective of the agreement that the car maker might have obtained/entered into with the concerned ancillary suppliers and thus ensure that

complaints are attended to promptly without the customer having to wait for long period.

7. The dealer should maintain proper records of complaints received from car users and the action taken.

20.5. *Concerning the Government*

1. The Indian Standards Institution should be requested to formulate, on priority basis. standards for raw materials and components with the assistance of the car makers, ancillary producers and their suppliers.
2. The car makers should be directed to adopt and implement Indian Standards as and when these are formulated
3. ISI Certification Marks Scheme should be made compulsory for all the ancillary producers on the basis of priorities to be established.
4. The public sector steel plants should be directed to make available raw materials of the qualities required by the industry, irrespective of the quantities involved.
5. The fabrication of special two-tier bogie wagons for transporting multiple cars by rail should be expedited.
6. The government should stop assistance to the ancillary producers whose products are found consistently sub-standard and take other corrective action. They should also not be permitted renewal of their foreign collaboration, if any.
7. All the three car makers should be directed to sell cars under a warranty which should be uniformly valid for a period of 12 months or a distance covered of 16,000 kilometres, whichever occurs earlier. Also, all defects due to manufacture or workmanship should be rectified and defective parts replaced during this period without passing any part of the burden, including incidental charges, to the customer.
8. In order to ensure that the car makers and the ancillary producers adopt the relevant recommendations enumerated above technical audit cells should be set up in the car makers plants and also in the ancillary producers units, individually or collectively, as considered necessary with a view to arresting the deterioration of quality and giving trouble-free service to the customers.
9. Foreign exchange should be made available more liberally for purchasing such raw material/components of the required quality as are not available at present in the country and the industry should be assisted in getting their men trained in overseas countries.
10. The Government may also consider permitting the car makers to manufacture "de luxe model" without price and distribution control, to provide necessary incentive for technological development, and also for improving the quality of the cars which are now being manufactured.
11. The Government should assist in the early setting up of the co-operative research and development organization for the

automobile industry which has already been agreed in principle. Till such time as this organization is set up, the facilities for testing of cars available with the Ministry of Defence should be utilized by the car makers.

12. The Government may also consider giving a rebate on the taxes to the car makers and the ancillary producers in proportion to the expenditure on inspection and quality control.
13. Government should consider imposing stricter driving tests before driving licences are granted.

CHAPTER 21

CONCLUSION

21.1. The main tasks assigned to the Motor Car Quality Enquiry Committee were to find what was wrong with the cars currently being made in the country, how their quality could be improved and how better user satisfaction could be achieved. In fact the Committee was well aware from the very commencement of its work that it would not be easy to find any quick solutions to these problems although it was possible to pin point the defects and locate the areas where they were pronounced. At the end of the detailed study the Committee's expectations and fears have been proved right. However, certain short term and long term measures have been indicated and a number of recommendations made, which when implemented must bring some substantial improvements in the cars that are currently being produced and thereby afford adequate relief to the car users. It must be admitted that the making of a passenger car is a complicated and tricky business and that utmost care has to be exercised in its manufacture. What is actually needed, at the moment in the country, is a change in the whole outlook of the car makers and the ancillary producers, a pride in their profession and a determination on the part of the management to set things right.

21.2. The Committee has not been able to recommend any relief to those who are already in possession of the cars manufactured in the recent past except that, with a change in the outlook and spirit of the car makers and the dealers, they should be able to get a better deal, at least in the future.

21.3. The Committee feels that it will not be out of place to mention again that it had to refrain from straying into the field of protection, costs and other allied major policies of the Government in connection with the car industry and had, therefore, to confine its work mainly to the sphere of how to build a better car in the existing conditions.

21.4. In the country today the passenger car enjoys a low priority in the schemes of our development and it is very difficult to make any accurate prediction of what the future has in store for it. Judging by the trends elsewhere, with the coming of prosperity, a big development is bound to take place in this sector here also and the automobile industry will have to play its proper role. Therefore, this industry even today must put its house in order and adopt all the modern means for quality production, not only to attain industrial efficiency, but also to give the maximum consumer satisfaction. It will be only thus that they will be able to carve a safe place for themselves in the scheme of things to come and contribute to national prosperity.

21.5. The Committee cannot forecast what the various interests will do but has concluded its task in the hope that something good will come out of its labours.

CHAPTER 22

ACKNOWLEDGEMENTS

22.1. The Committee wishes to acknowledge the grateful help it received from the public and various organisations and individuals who furnished all the basic data needed by it. The Committee also receive full cooperation from the motor car manufacturers, the ancillary producers, the small-scale manufacturers, the automobile dealers and their respective associations. The Committee takes this opportunity to express its grateful thanks to all of them.

22.2. The Committee would like to specially mention the assistance it received from the Directorate General of Technical Development (Automobile Division), the Indian Standards Institution and the National Industrial Development Corporation in its work.

23.3. The Committee would also like to place on record the untiring work put in by the secretarial staff, which greatly assisted it in completing its work.

(G. PANDE)
Chairman

(B S. KRISHNAMACHAR)
Member

(DEWAN RAHUL LALL)
Member

THI)

(N. T. GOPALA IYENGAR)
Member Secretary

APPENDIX A

COMPOSITION AND TERMS OF REFERENCE OF THE MOTOR CAR QUALITY ENQUIRY COMMITTEE

(CHAPTER 1—PARA 1.3)

GOVERNMENT OF INDIA

MINISTRY OF INDUSTRIAL DEVELOPMENT AND COMPANY AFFAIRS (DEPARTMENT OF INDUSTRIAL DEVELOPMENT)

New Delhi, the 11th July, 1967
20th Asadha, 1889

ORDER

WHEREAS there is a general complaint about the quality of motor cars manufactured in India;

AND WHEREAS the Central Government is of the opinion that in respect of the scheduled industry engaged in the manufacture and production of Motor Cars in India, there has been a marked deterioration in the quality of motor cars manufactured and produced in the said industry which could have been avoided;

NOW, THEREFORE, in exercise of the powers conferred by Section 15 of the Industries (Development and Regulation) Act, 1951 (65 of 1951), the Central Government hereby appoints for the purposes of a full and complete investigation into the circumstances of the case (including the aspects specified in the Schedule hereto annexed) a body of persons, to be known as the Motor Car Quality Enquiry Committee, consisting of—

1. Shri G. Pande, 7, Park Lane, Lucknow—*Chairman.*
2. Brig. T. B. Poduval, Officer on Special Duty, Ministry of Defence—*Member.*
3. Shri R. K. Sethi, Chief Consultant, Technological Consultancy Bureau, National Industrial Development Corporation—*Member.*
4. Shri B. S. Krishnamachar, Deputy Director General, Indian Standards Institution—*Member.*
5. Dewan Rahul Lall, 17-A, Stephen Court, Calcutta-16—*Member.*
6. Shri N. T. Gopala Iyengar, Development Officer, Directorate General of Technical Development—*Member Secretary**

2. The investigation aforesaid shall be completed and a report hereof submitted to the Central Government within three months.

SCHEDULE

(1) The extent of the deterioration in the quality of motor cars factured and produced by each of the industrial undertakings ing to the scheduled industry engaged in such manufacture duction;

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d vide Order dated 25th July, 1967/4th Sravana, 1889).

(2) The circumstances in or on account of which such deterioration has taken place and the reasons therefor;

(3) Whether each of the said undertakings has laid down minimum standards of quality and performance,

- (i) for the raw materials, components and sub-assemblies used in the manufacture and production of motor cars; and
- (ii) for the motor cars manufactured by them, and the extent to which and manner in which such minimum standards are ensured;

(4) Whether the equipment, facilities and arrangements available at each of the said undertakings of the proper testing and inspection,—

- (i) of the raw materials, component parts and sub-assemblies at the different stages of manufacture and assembly, and
- (ii) of the assembled cars prior to their sale, are adequate and the extent to which they are made effective use of; and whether additional facilities and arrangements either by way of augmentation of the existing facilities or otherwise are required in order to ensure better inspection and quality control;

(5) Whether, and if so the extent to which, the deterioration in the quality of cars is attributable to the sub-standard materials or components supplied by the indigenous, ancillary and other industries and whether any steps are to be taken to enable the manufacturers of the said undertakings to secure the said materials and components consistent with the minimum standards of quality and performance required of them;

(6) The nature and effectiveness of the warranties regarding the quality and performance of cars given by each of the said manufacturers; the adequacy of the arrangements made by each of them directly or through their dealers or other agents in respect of after sales service, maintenance and repair facilities and the promptness with which and the terms on which defects for which manufacturers are directly or indirectly responsible are remedied;

(7) Apart from the arrangements made by the manufacturers themselves for quality control and inspection, whether it is necessary and feasible for the Central Government to take any steps to ensure that minimum standards of quality are maintained by the said manufacturers, and, if so the nature of the steps to be taken.

(Sd. R. V. SUBRAHMANIAN)

Joint Secretary to the Government of India

APPENDIX B

LIST OF MOTOR CAR MAKERS, ANCILLARY PRODUCERS AND DEALERS VISITED, AND BODIES, ASSOCIATIONS AND ORGANISATIONS WITH WHOM DISCUSSIONS WERE HELD.

(CHAPTER 2—PARA 2.7)

I *Motor Car Makers*—

1. M/s. Hindustan Motors Ltd., P.O. Uttarpara, Distt. Hooghly (West Bengal).
2. M/s. Premier Automobiles Ltd., Agra Road, Kurla, Bombay.
3. M/s. Standard Motor Products of India Ltd., 29, Mount Road, Madras.

II. *Ancillary Producers*—

1. M/s. Bimetal Bearings Ltd., Huzur Gardens, Sembiam, Madras.
2. M/s. Brakes India Ltd., 37, Mount Road, Madras.
3. M/s Carburettors Pvt. Ltd., 29, Mount Road, Madras.
4. M/s. Engine Valves Ltd., 354, M.K.N. Road, Madras-16.
5. M/s. India Pistons Ltd., Huzur Gardens, Sembiam, Madras-11.
6. M/s. India Pistons Repco Ltd., Huzur Gardens, Sembiam, Madras-11.
7. M/s. Lucas—TVS Pvt. Ltd., 37, Mount Road, Madras.
8. M/s. Union Co. (Accessories) Pvt. Ltd., 29, Mount Road, Madras.
9. M/s. Wheels India Ltd., 37, Mount Road, Madras.
10. M/s. International Instruments Ltd., 20/4 Jayachamaraja Wadiar Road, Bangalore-2.
11. M/s. Motor Industries Co. Ltd., Adugodi, Bangalore.
12. M/s. Automobile Products of India Ltd., Bhandup, Bombay.
13. M/s. Bharat Radiators Ltd., Central Salsette Road, Bombay.
14. M/s. Ex-Cell-O-India Ltd., 78-B, Dr. Annie Besant Road, Bombay.
15. M/s. Gabriel India Ltd., Agra Road, Mulland, Bombay.
16. M/s. Globe Auto Electricals Ltd., Agra Road, Mulund (West), Bombay-80.
17. M/s. Victor Gaskets India Ltd., S-305 Agra Road, Mulund, Bombay.
18. M/s. Usha Automobiles & Engineering Co. Ltd., 14, Princep Street, Calcutta.

9. M/s. Orient General Industries, 14, Radha Bazar Lane, Calcutta.

M/s. Auto Lamps Ltd., 6, Alipur Road, Delhi-6.

/s. J.M.A. Industries Ltd., No. 8, Padmini Enclave, Hauz as, New Delhi-28.

22. M/s. Payen Talbros Pvt., Ltd., 71/3, Najafgarh Industrial Area, New Delhi-15
23. M/s. Prestolite of India Ltd., Kundan Mansion, 2-A/3, Asaf Ali Road, New Delhi.
24. M/s. Super Seals India Pvt. Ltd., 21-A, Nizamuddin West, New Delhi-13.

III. *Dealers*—

1. M/s. Bagai Motors Service, 82—84, Janpath New Delhi.
2. M/s. Premnath Motors (P) Ltd., Scindia House, New Delhi
3. M/s. Sikand and Comany, 50, Janpath, New Delhi.
4. M/s. Bombay Cycle and Motor Agency Ltd., 534, Sardar Vallabh Bhai Patel Road, Bombay-7.
5. M/s. French Motor Car Co., Ltd., Bombay.
6. M/s. Metro Motors, The Motor House, Hughes Road, Bombay-7.
7. M/s. National Garage Pvt. Ltd., Bhulabhai Desai Road, Bombay-26.
8. M/s. Delhi Automobiles (P) Ltd., 3/15/A, Asaf Ali Road, New Delhi.
9. M/s. Sundaram Motors Pvt. Ltd., 37 Mount Road, Madras-6.

IV. *Bodies, Associations and Organizations*—

1. Ministry of Industrial Development and Company Affairs. Dpt of Industrial Development, Udyog Bhavan, New Delhi.
2. Directorate General of Technical Development, Udyog Bhavan. New Delhi.
3. Development Commissioner, Small Scale Industries, Nirman Bhavan New Delhi.
4. Council of Scientific & Industrial Research, Rafi Marg, New Delhi.
5. Director General, Indian Standards Institution, Manak Bhavan, New Delhi.
6. Tariff Commission, Bombay.
7. Central Mechanical Engineering Research Institute, Durgapur
8. Chairman, Develoment Council for Automobiles, Automobile Ancillary Industries, Transport Vehicle Industries, Tractors, Earthmoving Equipments, Internal Combustion Engines.
9. President, Association of Indian Automobile Manufacturers, Army and Navy Building, Mahatma Gandhi Road, Fort, Bombay.
10. Secretary, Motor Manufacturers Association, UK.
11. President, All India Automobile & Ancillary Industries Assn., Bombay.
12. President, Federation of All India Automobile Spare Parts Dealers Associations, 3620/21, Netaji Subhash Marg, Darya Ganj, Delhi.
13. Federation of Associations of Small Industries of India, 23 B/2, Rohtak Road, New Delhi.

APPENDIX C

SUMMARY OF COMPLAINTS PER 1,000 AMBASSADOR CARS AS ASSESSED FROM THE INFORMATION GIVEN BY THE CAR MAKER, THE DEALERS AND THE USERS.

(CHAPTER 4 PARA 4.3)

Group	1962-63	1963-64	1964-65	1965-66	1966-67
1. Body	172	112	116	105	113
2. Engine	108	163	145	248	255
3. Gearbox	98	100	123	158	155
4. Transmission	260	213	186	198	205
5. Suspension	208	90	89	67	89
6. Steering	99	50	57	110	103
7. Brakes	12	12	10	8	13
8. Electricals	66	168	340	470	450
9. Instruments	39	22	34	28	46
10. Miscellaneous	340	216	248	332	322
No. of cars produced during the period	10,942	11,500	15,575	17,800	20,423

APPENDIX D

SUMMARY OF COMPLAINTS PER 1,000 FIAT CARS AS ASSESSED FROM THE INFORMATION GIVEN BY THE CAR MAKER, THE DEALERS AND THE USERS.

(CHAPTER 4 PARA 4.3)

Group	1962-63	1963-64	1964-65	1965-66	1966-67
1. Body	196	250	125	202	240
2. Engine	132	85	32	68	99
3. Gear Box	183	183	148	132	164
4. Rear Axle	66	94	80	83	57
5. Suspension	107	57	40	55	93
6. Steering	7	8	12	33	41
7. Brakes	13	19	23	46	30
8. Electrical	201	82	75	250	162
9. Instrumentation					
10. Miscellaneous	620	420	410	590	420
No. of cars produced during the period	4,378	4,052	4,839	5,733	8,662

APPENDIX E

SUMMARY OF COMPLAINTS PER 1,000 STANDARD HERALD CARS AS ASSESSED FROM THE INFORMATION GIVEN BY THE CAR MAKER, THE DEALERS AND THE USERS.

(CHAPTER 4 PARA 4.3)

Group	1962-63	1963-64	1964-65	1965-66	1966-67
1. Body	25	23	21	24	11
2. Engine	69	35	38	132	83
3. Gear Box	13	55	116	262	97
4. Transmission	70	75	38	77	65
5. Suspension	..	..	..	..	..
6. Steering	..	..	..	..	..
7. Brakes	6	4	5	28	29
8. Electrical .. .. .. 9. Instruments	38	19	20	15	19
10. Miscellaneous	82	72	130	172	101
No. of cars produced during the period	3,340	4,008	3,559	1,098	1,632

Appendix F

LIST OF ADDITIONAL EQUIPMENTS REQUIRED BY M/S HINDUSTAN MOTORS LTD. FOR QUALITY CONTROL

(Chapter 5 Para 5.9.1)

Serial No.	Description of Equipments	Quantity
1	Shadow Graph. KODAK 10×20×60×100 magnification	1 Off
2	Contour Projector	2 ,,
3	Contact Sectioning Surface finish Tester complete with recording attachments	2 ,,
4	Cam-shaft Tester with optical dividing head	1 ,,
5	Engineer's Microscope with Telescope c/w cross wire eyepe, illuminated platform having movement in all 3 axes	1 ,,
6	Electric Testing apparatus to test all electrical equipments	1 ,,
7	Fuel Pump Tester	1 ,,
8	Fuel Injection Tester	1 ,,
9	Tallyround Machine complete with graphical recorder	1 ,,
10	Adjustable Template gauge for checking forms on Sheet Metal jobs ..	1 ,,
11	Thermocouple	2 ,,
12	Vicker's Hardness Tester	1 ,,
13	Polishing machine for case depth sample polishing	1 ,,
14	Gloss Meter	1 ,,
15	One Engine Test Bed with Dynamometer and complete set of instrument panel for life and reliability test	1 ,,
16	Magnetic wall thickness tester	2 ,,
17	Mechanical Crack detector for Con. Rod.	1 Set
18	Automatic hardness testing unit for 100% check of Tappet ..	1 Off
19	Exhaust Analyser	1 ,,
20	Hydraulic Spring Testing Machine	1 ,,
21	Equipment for checking noise, radial and axial play, on anti-fraction bearings	1 Set
22	Fixture to check Bimetal bearings for parting line height	1 Off
23	Erickson's Test	1 ,,
24	Torque Meter with light attachment 400/2000/10000 ft. lbs. ..	2 ,,
25	Spark Plug Tester	2 ,,

APPENDIX G

LIST OF DEFECTIVE BOUGHT OUT ITEMS OF AMBASSADOR CAR

(CHAPTER 6 PARA 6.1)

Sl No. and Description of the Item—

1. Main Bearings, Con. Rod Bearings.
2. Timing Chain.
3. Seal G/B & Rear Axle.
4. Hand Lever & Control Rod.
5. Tie Rod Ends.
6. Steering Wheels.
7. Steering Rack Seal.
8. Shock Absorber.
9. Front Suspension Bush.
10. Road Springs.
11. Accelerator Cable.
12. Instruments.
13. Clutch.
14. Propeller Shaft.
15. Electrical Items like—

    Dynamo, Startermotor, Voltage Regulator, Horn, Horn Relay, Flasher etc.
16. Bulbs.
17. Harness.
18. Wiper Arms & Blade.
19. Regulators & Door Lock.
20. Wind Screen Rubber.
21. Glass Run Channel.
22. Luggage Proof Lock,
    Frt. Seat and Seat Springs.
23. Rubber Matting.
24. Wind Screen Glass.
25. Cylinder Head Gasket.
26. Finishers.

APPENDIX H

LIST OF DEFECTIVE BOUGHT OUT ITEMS OF FIAT CAR

(CHAPTER 8 PARA 8.1)

Sl. No. and Description of the Item—

1. Temperature Gauge.
2. Fuel Tank Float Unit.
3. Horns.
4. Ignition Switch.
5. Wiper Arm & Blade.
6. Low Oil Pressure Switch.
7. Fuse Box.
8. Signal Light Release Switch.
9. Door Glass Regulators.
10. Door Locks and Remote Controls.
11. Steering Column Cover.
12. Water Pump & Seal.
13. Frt. & Rear Engine Oil Seals.
14. Wind Screen Glass.
15. Door Handles & Regulator Handles.
16. Door Opening Weather Cords.
17. Roof Ribs.
18. Door Pads (Sponge).
19. Stabilizer Bar Bushes.
20. Quarter Window Frames.
21. Timing Chain.
22. Roof Lamps.
23. Bumper/Bumper Guards (Plated).
24. Steering Wheels.
25. Gear Shift Lever Knob.
26. Door Frames.
27. Suspension Coil Springs.
28. Water Sprayer.
29. Door Pad Clips.
30. Wheel Hub Cap Clip.
31. Pinion Drive Oil Seal.
32. Door Guide Block.
33. Top Cover Breather Hose.
34. Side Cover Breather Hose.
35. Oil Return Hose from Filter to Sump.
36. Engine Front Mountings.
37. Engine Rear Mountings.
38. Carburettor Gaskets.
39. Wiper Motor.
40. Starter.
41. Speedometer Cable.
42. Rear View Mirrors.
43. Wheel Cylinder Washers
44. Front Wheel Bearing.
45. Miniature Bulbs.
46. Articulated Check Arm.
47. Vent Wing Handles.

APPENDIX I

LIST OF ADDITIONAL EQUIPMENTS REQUIRED BY M/S STANDARD MOTOR PRODUCTS OF INDIA LTD FOR QUALITY CONTROL.

(CHAPTER 9 PARA 9.8)

Sl. No. and Description of Equipments—

1. Surface Finish Measuring Equipment complete with reading attachment.
2. Profile Projector and Thread Form Gauges.
3. Parkson Gear Roll Tester.
4. Hardness Tester for checking hardness on gear teeth.
5. Equipment for checking noise, axial and radial clearances on ball and roller bearings.
6. Erickson Testing Equipment.
7. Equipment for checking bimetal bearings for parting line checking.
8. Engine Tuning set with Oscilloscope.
9. Cox Roller Tester complete with Wheel Alignment and Brake Bending device.
10. Ultrasonic Crack Detector.
11. Engine Test Bed with Dynamometer of Swinging Field or Eddy Current type.
12. Laboratory Hot Air Oven and Muffle Furnace.
13. Carbon and Sulphur Estimation Apparatus.
14. Rockwell Superficial Hardness Tester.
15. Magnetic Sorting Bridge.
16. B.N.F. Coulometire Thickness Tester.
17. "SPEKKER" Steeloscope.
18. "PH" Meter.
19. Universal Testing Machine.
20. Vickers Prospection Microscope.
21. "GAS" Test Apparatus for accelerated corrosion test.
22. IZOD Impact Tester.

APPENDIX J

LIST OF DEFECTIVE BOUGHT OUT ITEMS OF STANDARD HERALD CAR

(CHAPTER 10 PARA 10.1)

Sl. No. and Description of the Item—

1. Direction Indicator Switch.
2. Lighting Switch-Steering Column.
3. Master Light Switch.
4. Wiper Switch.
5. Choke Control Cable Assy.
6. Escutcheon Door Handle.
7. Horn Button.
8. Stop/Tail/Flasher Lamp Assy.
9. Number Plate Illumination lamp Assy.
10. Front Flasher Lamp.
11. Name Plate 'Standard'.
12. Side Lamp.
13. Name Plate bonnet Assy.
14. Accelerator Pedal.
15. Base Rubber—tail lamp.
16. Driving Mirror.
17. Weather Strip Header Rail.
18. Ignition Starter Switch.
19. Locking Button door Handle.
20. Non-locking Button.
21. Trunklid Handle.
22. Bonnet Catch Assy.
23. Window Regulator Mechanism.
24. Remote Control Assy.
25. Spring Case Assemblies—Rear Cushions & Squab.
26. Bonder Bushes.
27. Engine Mounting Rubber.
28. Gear Box Mounting Rubber.
29. Bonnet Sealing Rubber.
30. Radiator Hoses: Bottom & Top.
31. Mounting Grommet-Front Exhaust Pipe.
32. Door Seal Rubber.
33. Glass Channel LH & RH.

34. Weather Strip waist door inner.
35. Wiper Arm & Blade.
36. Hand Brake Assy.
37. Seat Slide Assy. LH & RH.
38. Engine Mounting Foot LH & RH
39. Compensating Sector Head Brake
40. Trunklid Stay & Sliding Unit.
41. Hand Brake Control Assy.
42. Rubber Bush Wishbone Inner Fulcrum
43. Water Pump Seal.
44. Oil Pump Assembly.
45. Propeller Shaft.
46. Steering Wheel.
47. Rear Road Spring.
48. Clutch Assembly.
49. Coil Spring.

सत्यमेव जयते